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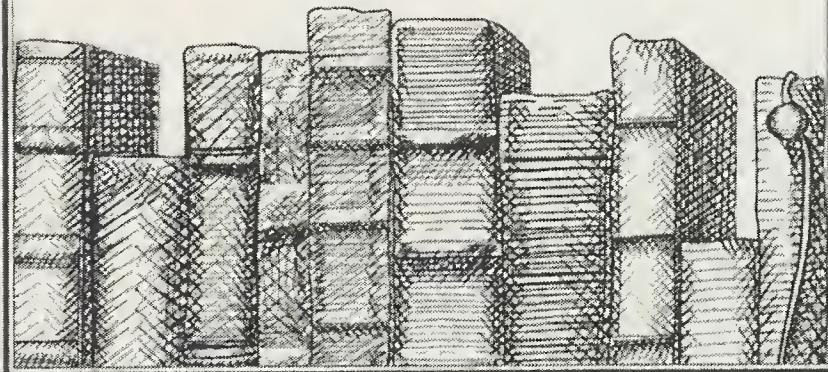
EADS BRIDGE
AT
ST. LOUIS



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Malcolm and Dianne Niedner





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ILLINOIS AND ST. LOUIS BRIDGE,

JAMES B. EADS, CHIEF ENGINEER.

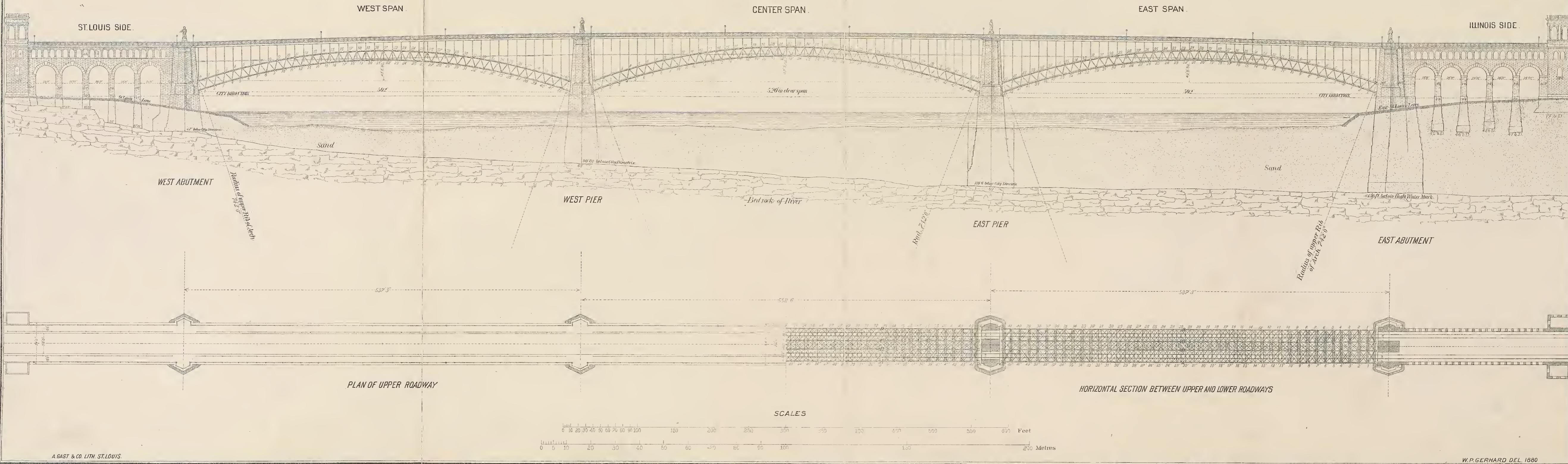
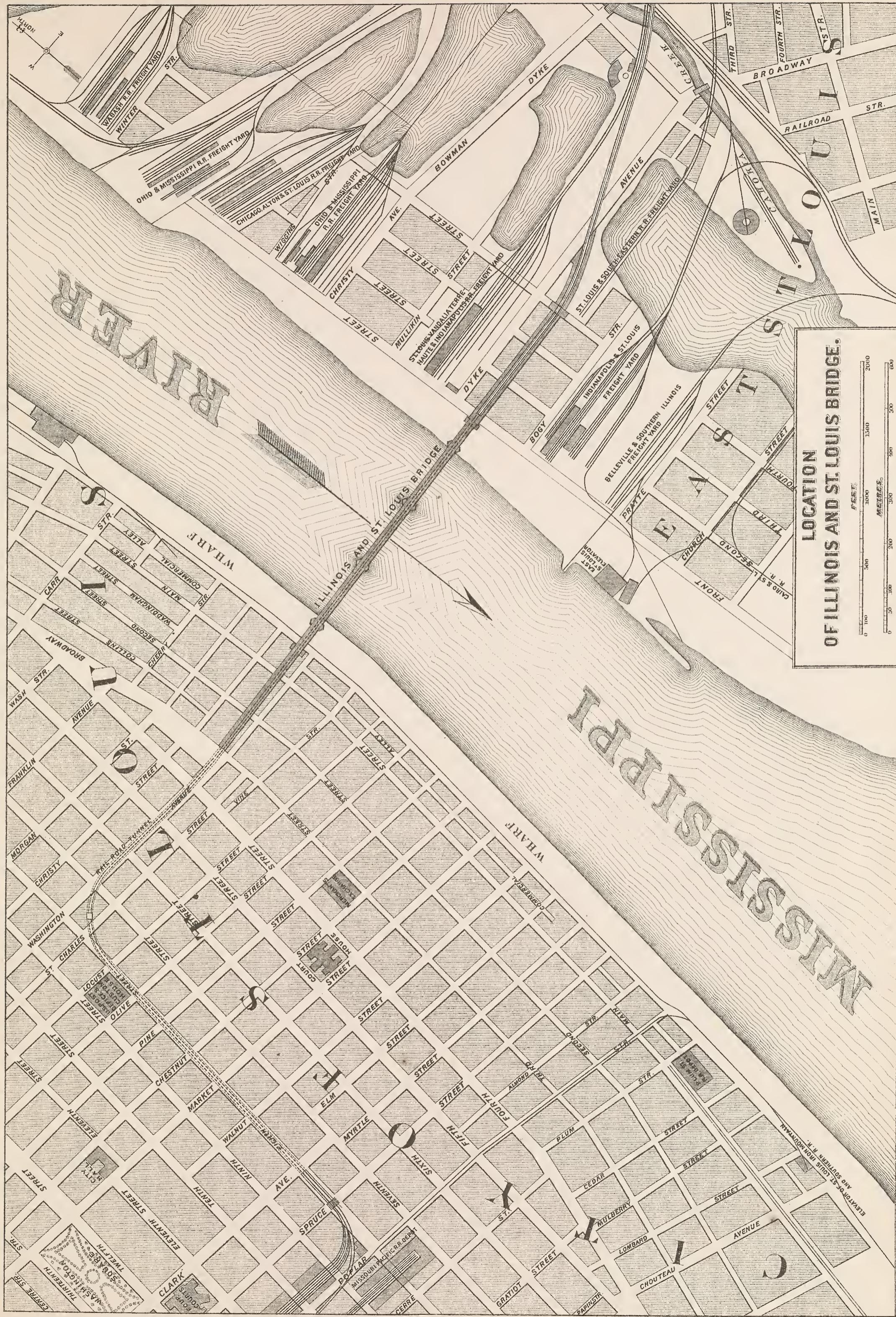


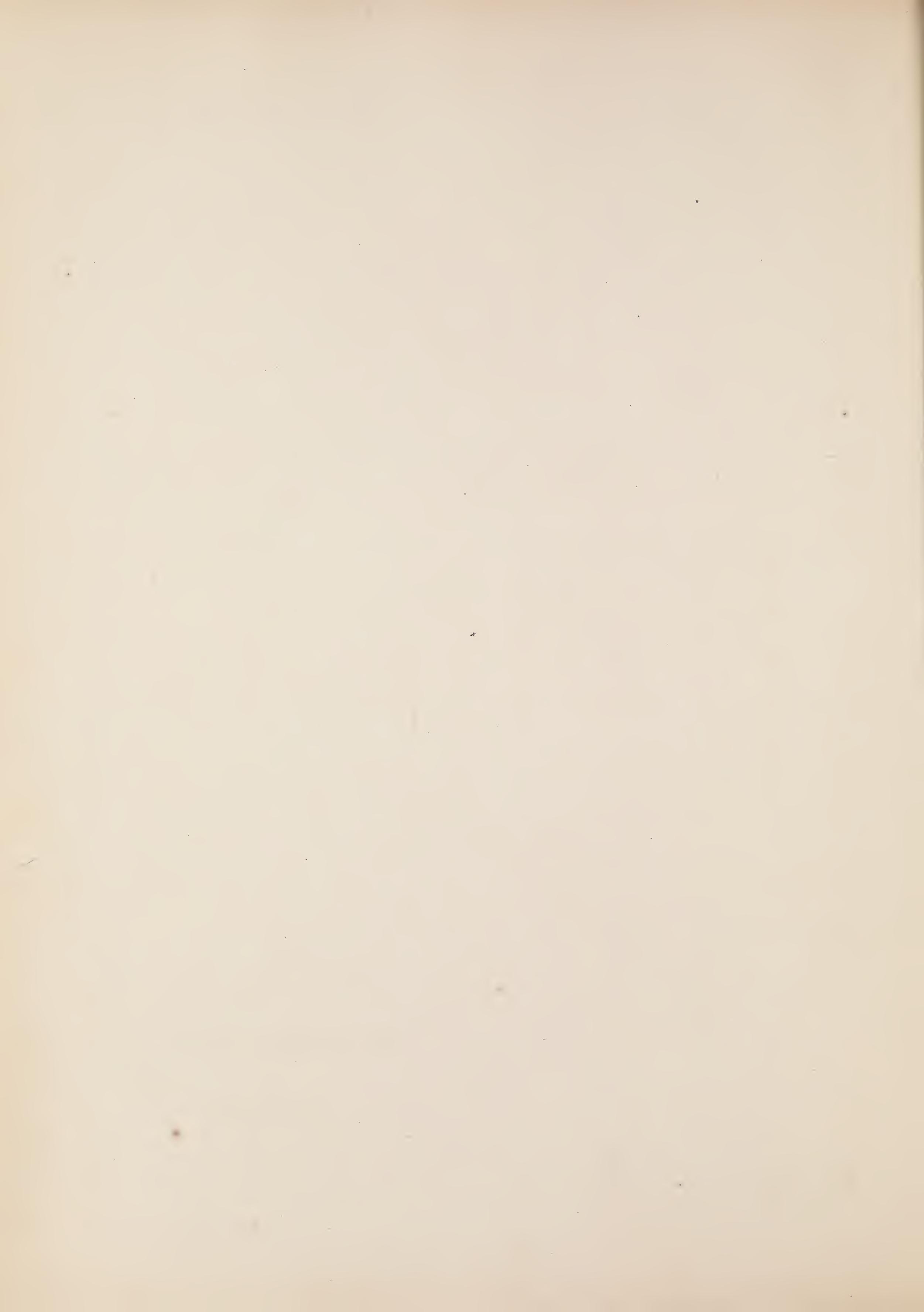


Plate II.

W. P. Cuthbert, M. D., 1880.

LOCATION
OF ILLINOIS AND ST. LOUIS BRIDGE.





PROFILE OF BRIDGE.

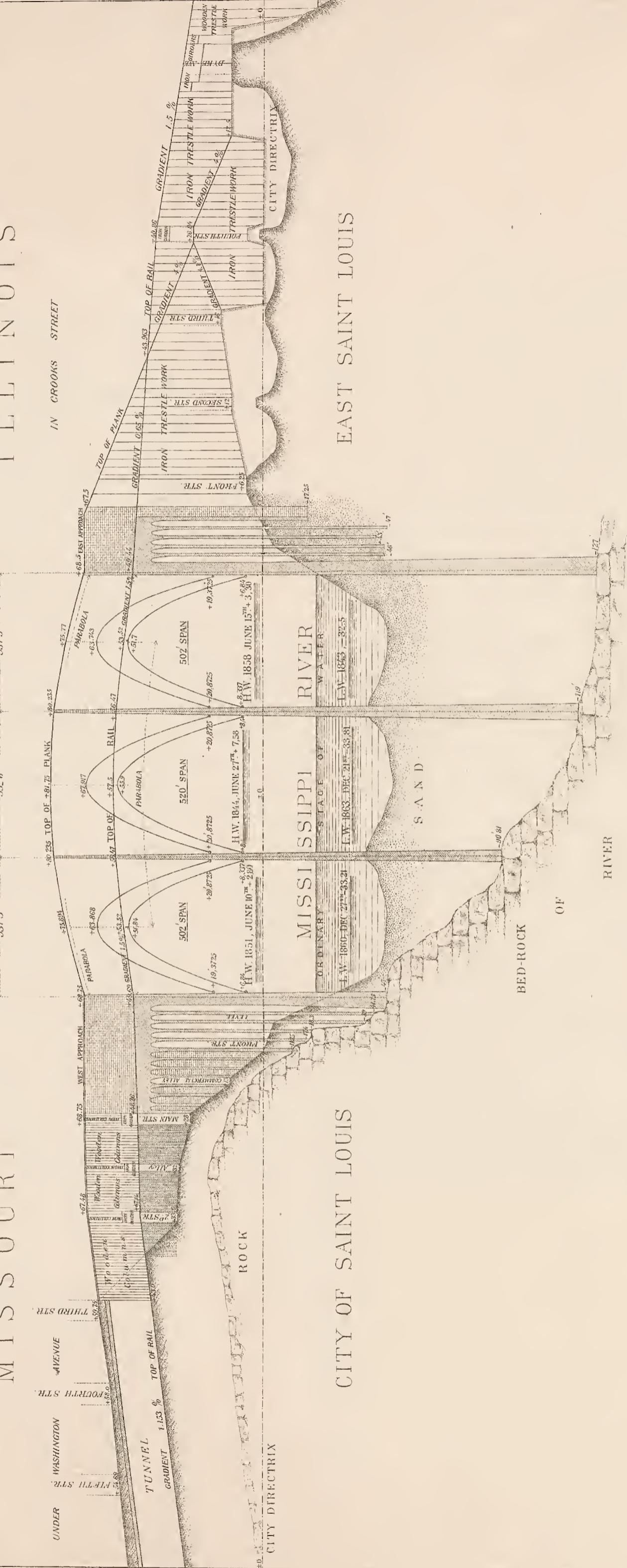
MISSOURI

UNDER 25 WASHINGTON ST. AVENUE

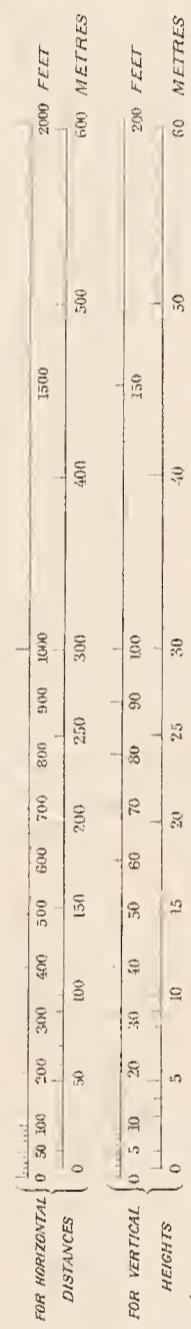
ILLINOIS

CITY OF SAINT LOUIS

EAST SAINT LOUIS



SCALES.



DIAGRAMS SHOWING THE INFLUENCE OF VARIABLE LOADS
ON THE RIBS OF CENTRAL ARCH (520 FEET SPAN.).

SUPPOSITIONS MADE FOR THE CALCULATIONS.

WEIGHT OF SUPERSTRUCTURE = 1 TON, MOVABLE LOAD = 0.8 TONS PER RUNNING FOOT OF A RIB. AREA OF EACH OF THE TWO MEMBERS OF A RIB IN ENDPieces ($\frac{1}{2}$ OF SPAN EACH) = 100.5 SQ. INS. IN CENTERPIECE 67 SQ. INS. DISTANCE BETWEEN CENTERS OF THE TWO MEMBERS OF A RIB = 12'.

DIAGRAM 1.

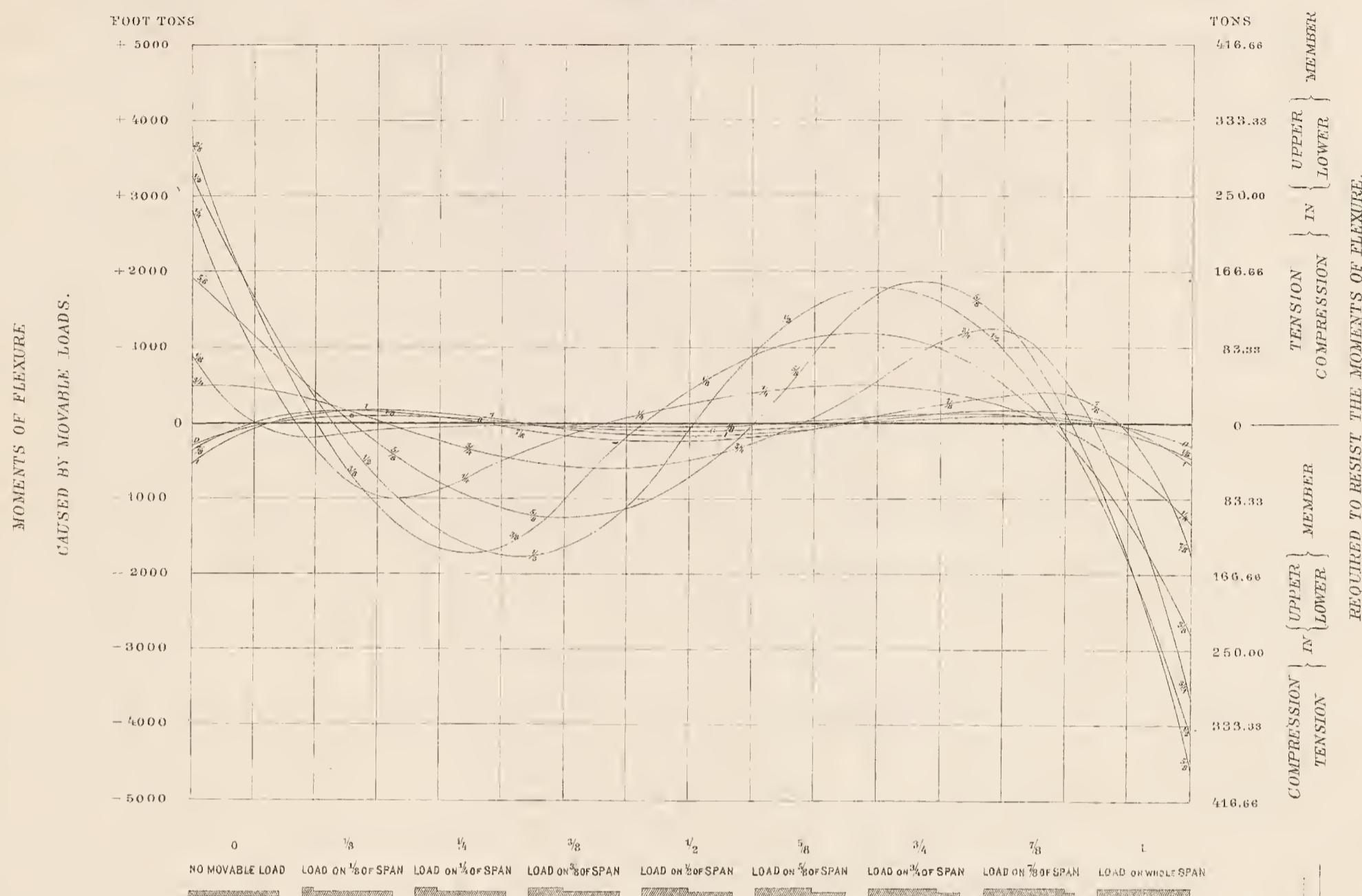
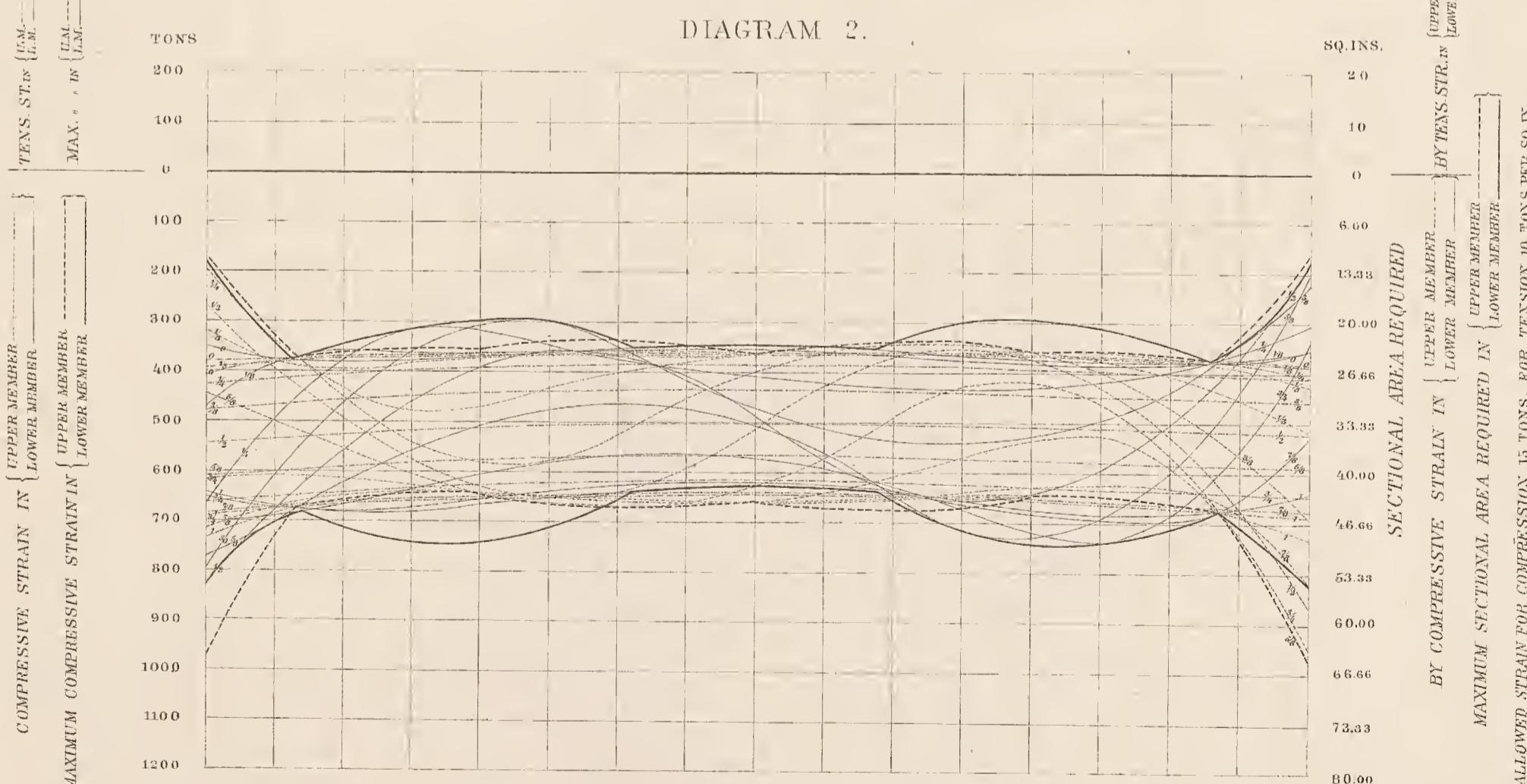


DIAGRAM 2.



THE solid lines show the compression or required area in one member for the force in the

DIRECTION OF ARCH WITHOUT REGARDING THE MOMENTS OF FLEXURE.

DIAGRAMS SHOWING THE INFLUENCE OF TEMPERATURE
ON THE UPPER AND LOWER MEMBER OF A RIB OF CENTRAL ARCH.

SUPPOSITIONS MADE FOR THE CALCULATION

AREA OF ONE MEMBER IN ENDPieces ($\frac{1}{2}$ OF SPAN EACH) 100.5 SQ.INS, FOR CENTER PIECE 67 SQ.INS - DISTANCE BETWEEN THE CENTERS OF
UPPER AND LOWER MEMBERS OF A RIB-12 FT. MODULUS OF ELASTICITY OF CAST STEEL $\{27,000,000 \text{ LBS. PER SQINCH}\}$ EXTENSION BY $80^\circ\text{F} - 0.000527$ OF ITS ORIGINAL LENGTH.

DIAGRAM 1.

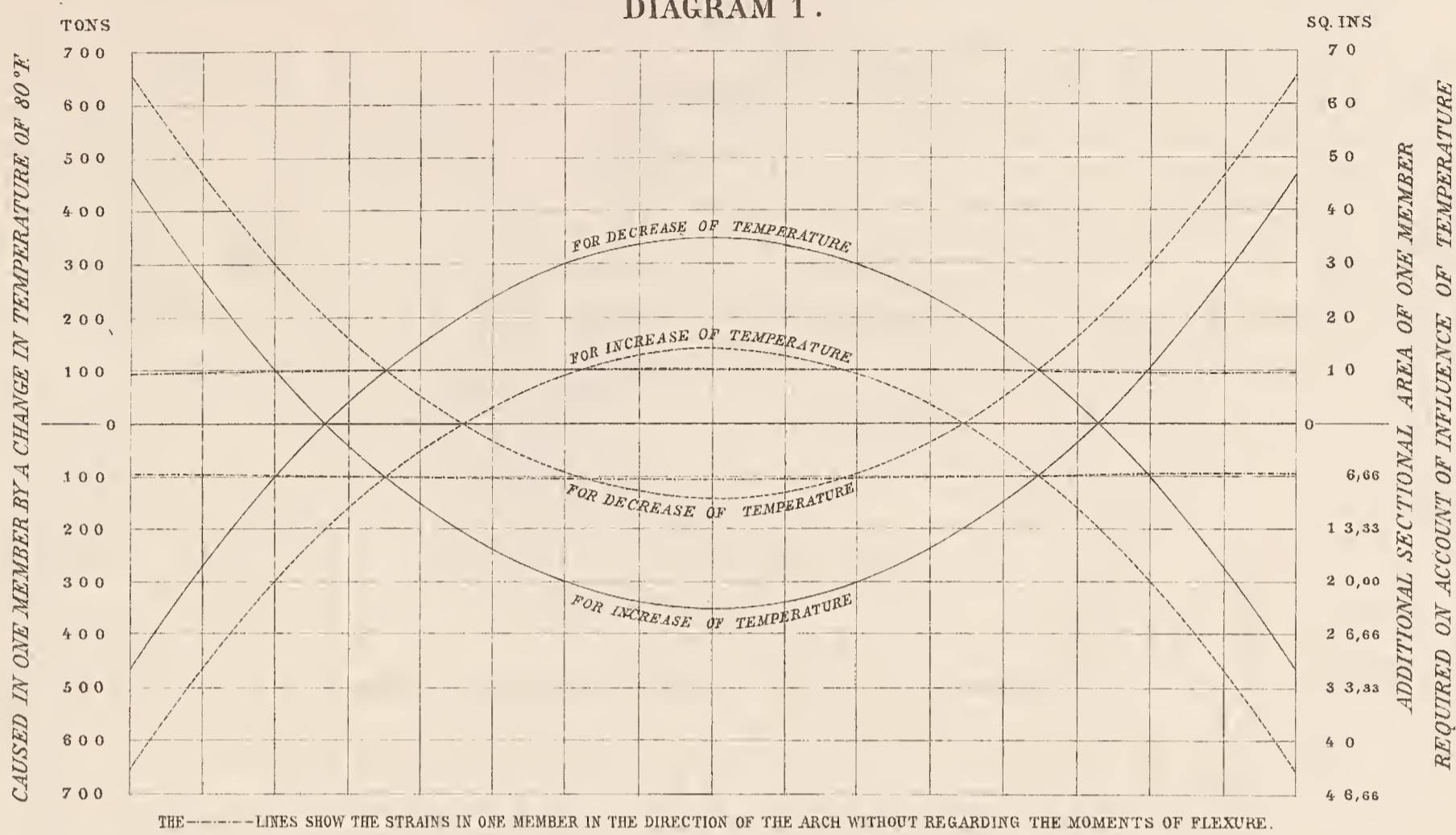
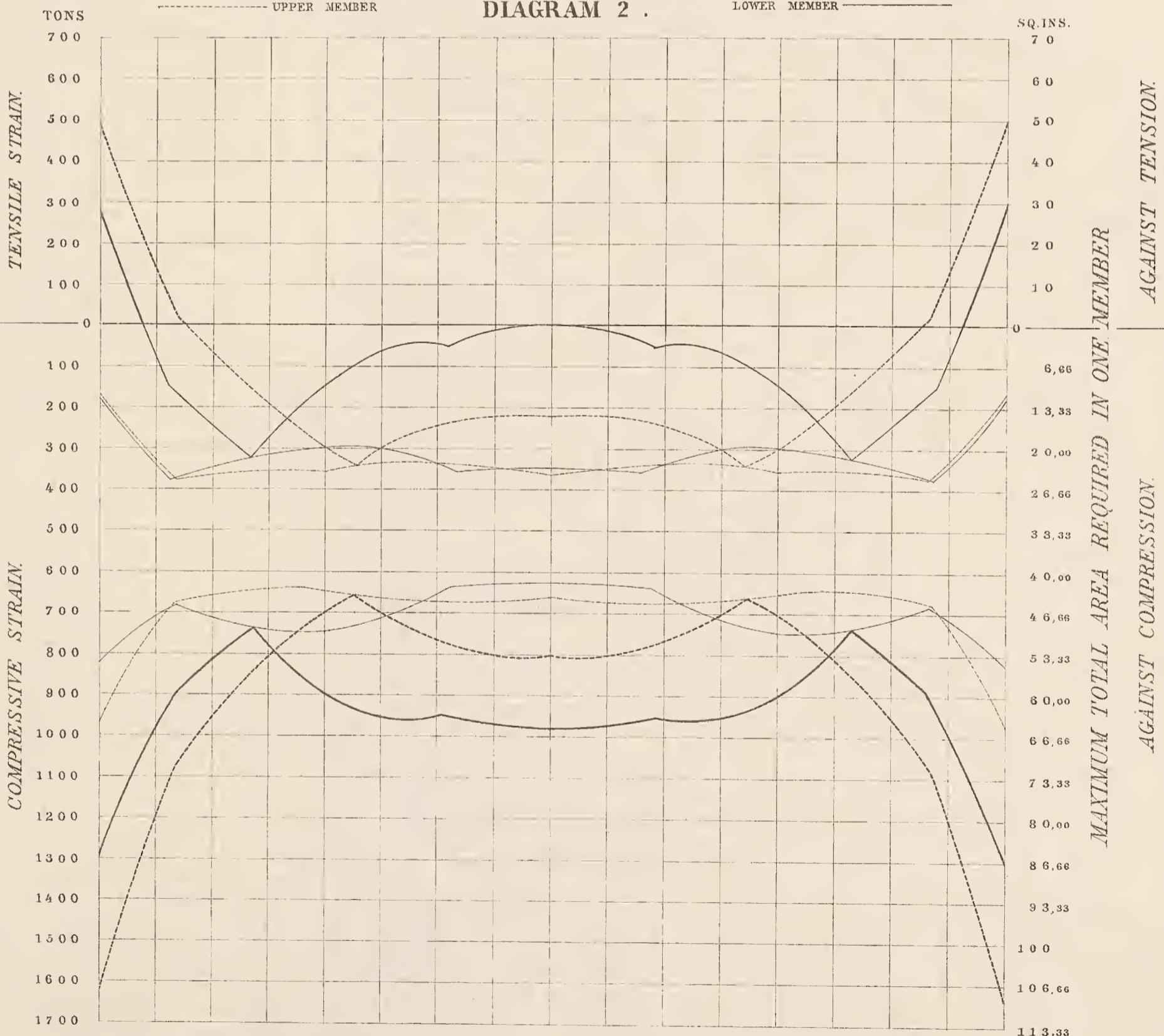


DIAGRAM 2.



THE LIGHT LINES SHOW THE MAXIMUM STRAIN OR AREA WITHOUT REGARDING THE INFLUENCE OF TEMPERATURE.

DIAGRAMS SHOWING THE STRAINS IN THE BRACES OF CENTER SPAN.

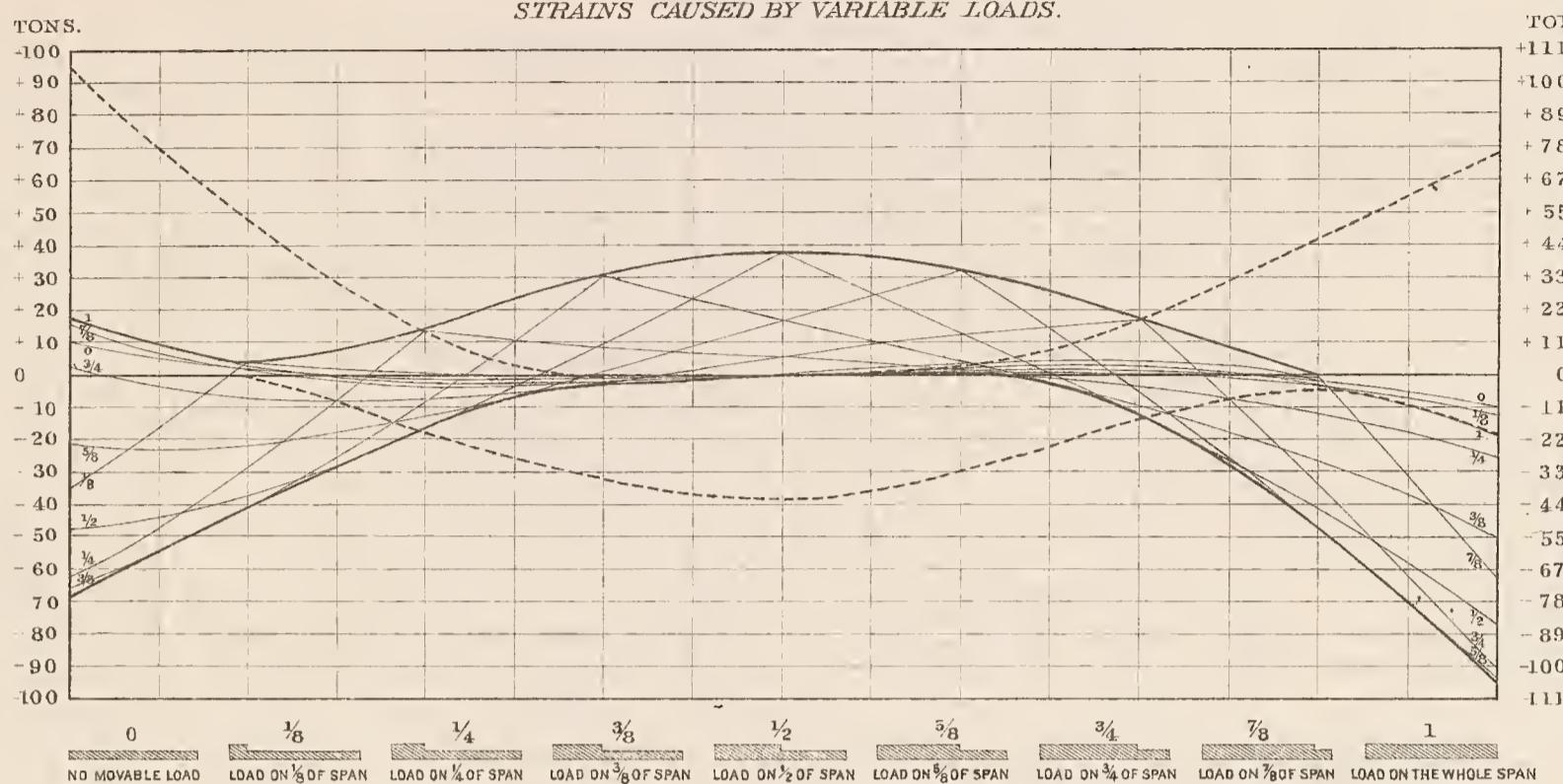
SUPPOSITIONS MADE FOR THE CALCULATIONS:

WEIGHT OF SUPERSTRUCTURE=1 TON, MOVABLE LOAD=0.8 TONS PER RUNNING FOOT OF A RIB. AREA OF EACH OF THE MEMBERS OF A RIB IN ENDPIECES ($\frac{1}{12}$ OF SPAN EACH)=100.5 SQ. INS. IN CENTER PIECE=67 SQ. INS. DISTANCE BETWEEN THE CENTERS OF THE UPPER AND LOWER MEMBER OF A RIB=12 FEET. MODULUS OF ELASTICITY OF CAST-STEEL=27.000.000 LBS PER SQ. INS.

EXPANSION OF CAST-STEEL FOR 80°F =0.000.527 OF ITS ORIGINAL LENGTH.

DIAGRAM 1.

STRAINS NORMAL TO THE ARCH (STEARING STRAINS)



THE FULL LINES SHOW THE MAXIMA OF STRAIN FOR A LOAD MOVING FROM THE LEFT TO THE RIGHT.

THE BROKEN LINES SHOW MAXIMA OF STRAIN FOR A LOAD MOVING FROM THE RIGHT TO THE LEFT.

DIAGRAM 2.

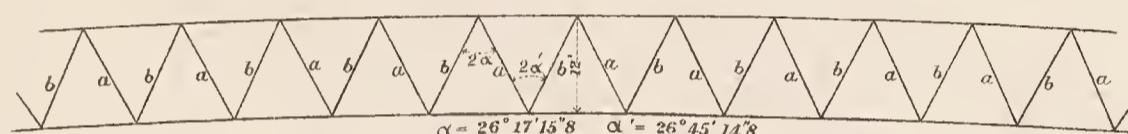


DIAGRAM 3.

STRAINS NORMAL TO THE ARCH.

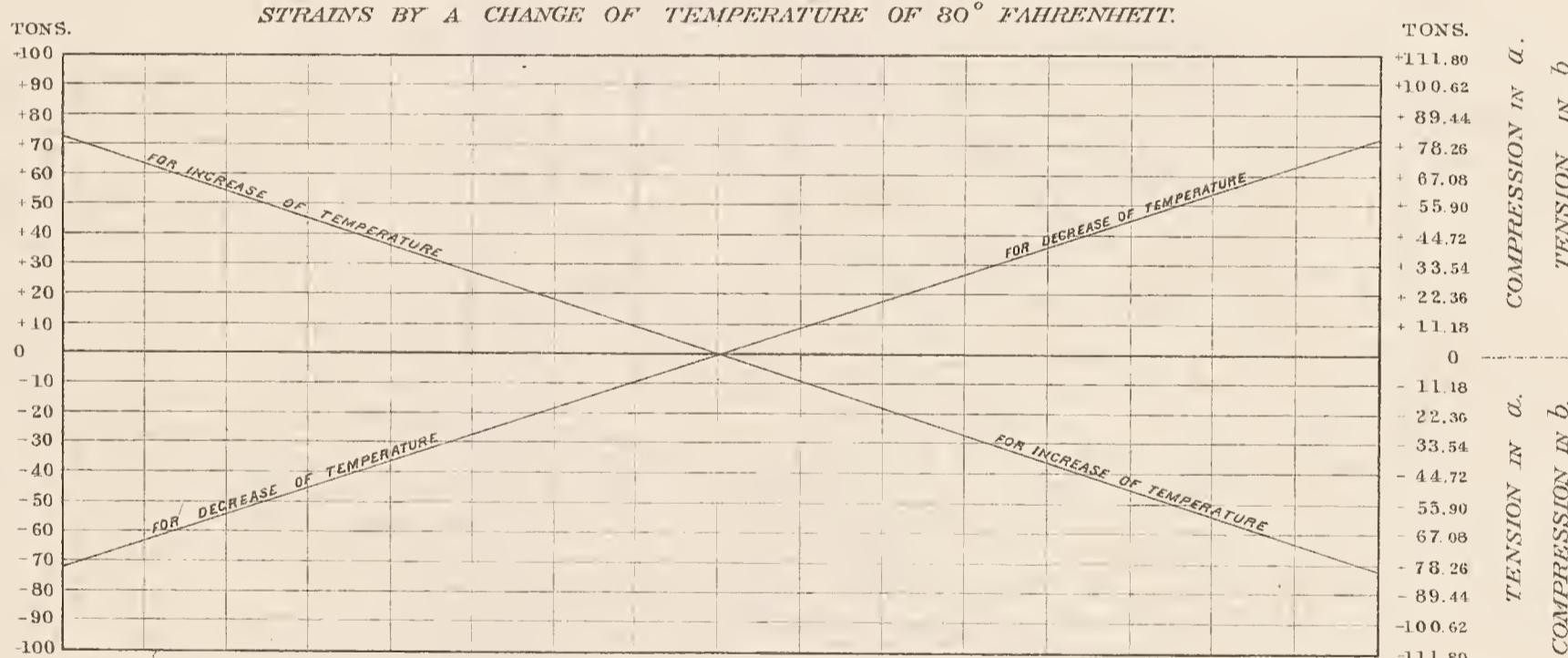
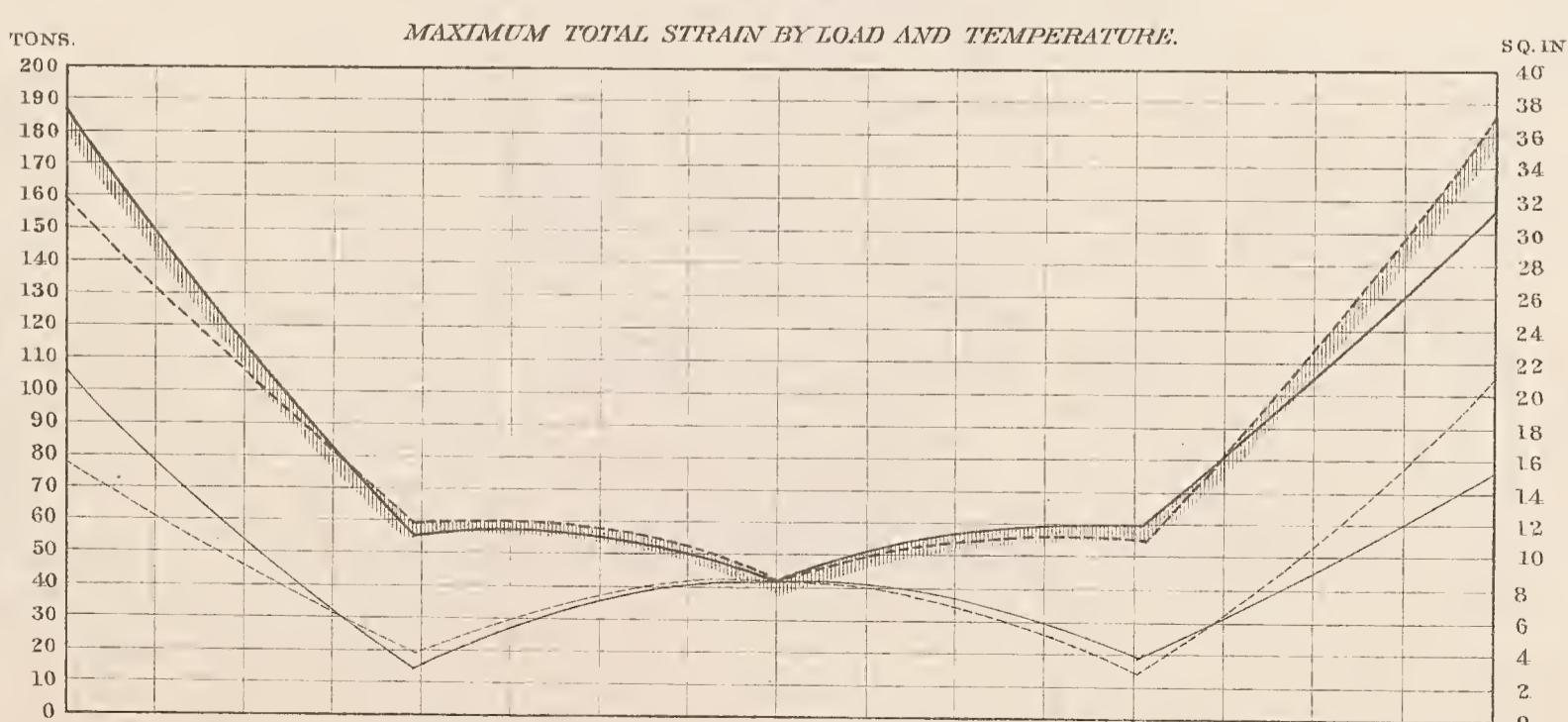


DIAGRAM 4.

MAX. { COMPR. TENS. } STRAIN IN BRACES { a. b. } MAX. { TENS. } STRAIN IN BRACES { a. b. } MAX. { COMPR. } STRAIN IN BRACES { a. b. }

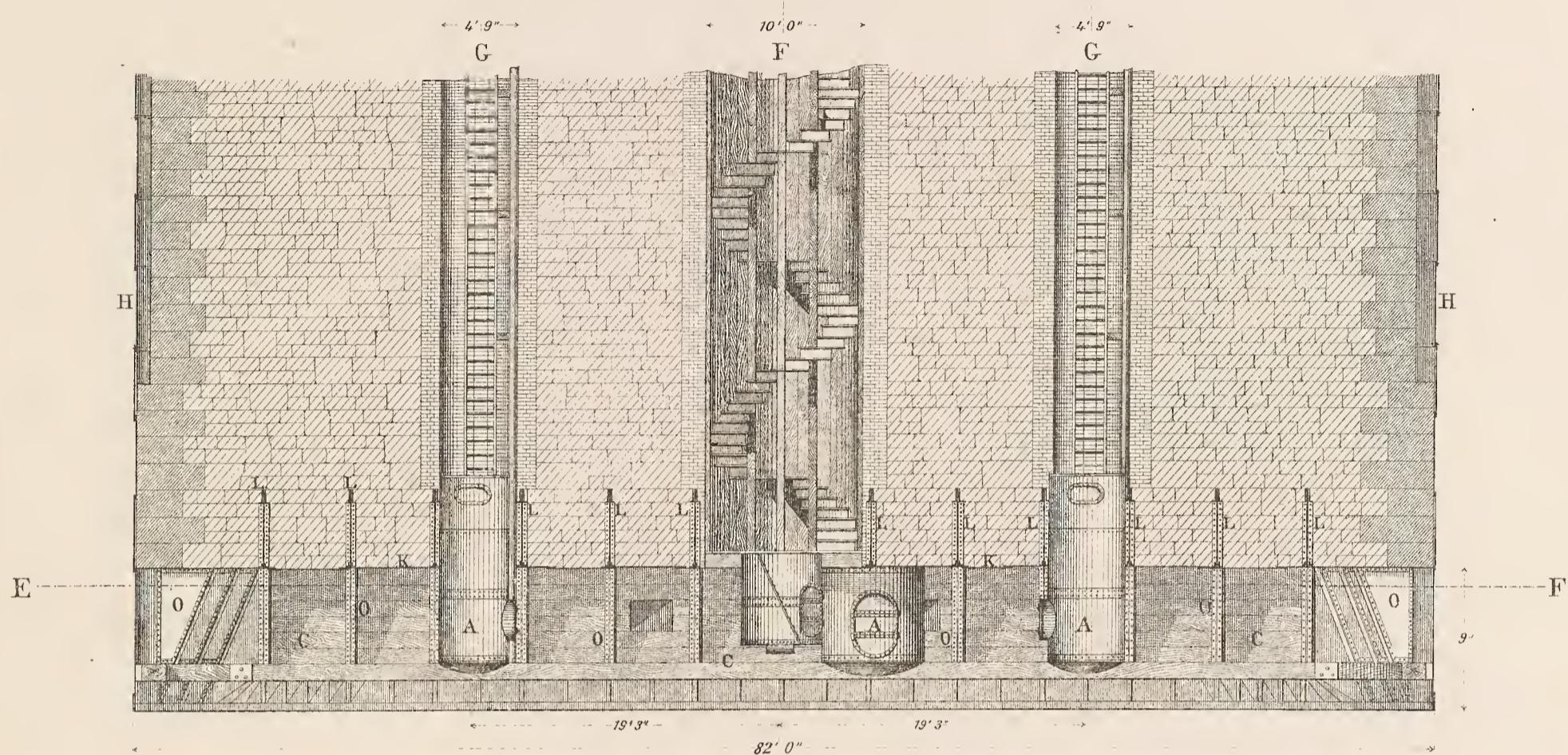
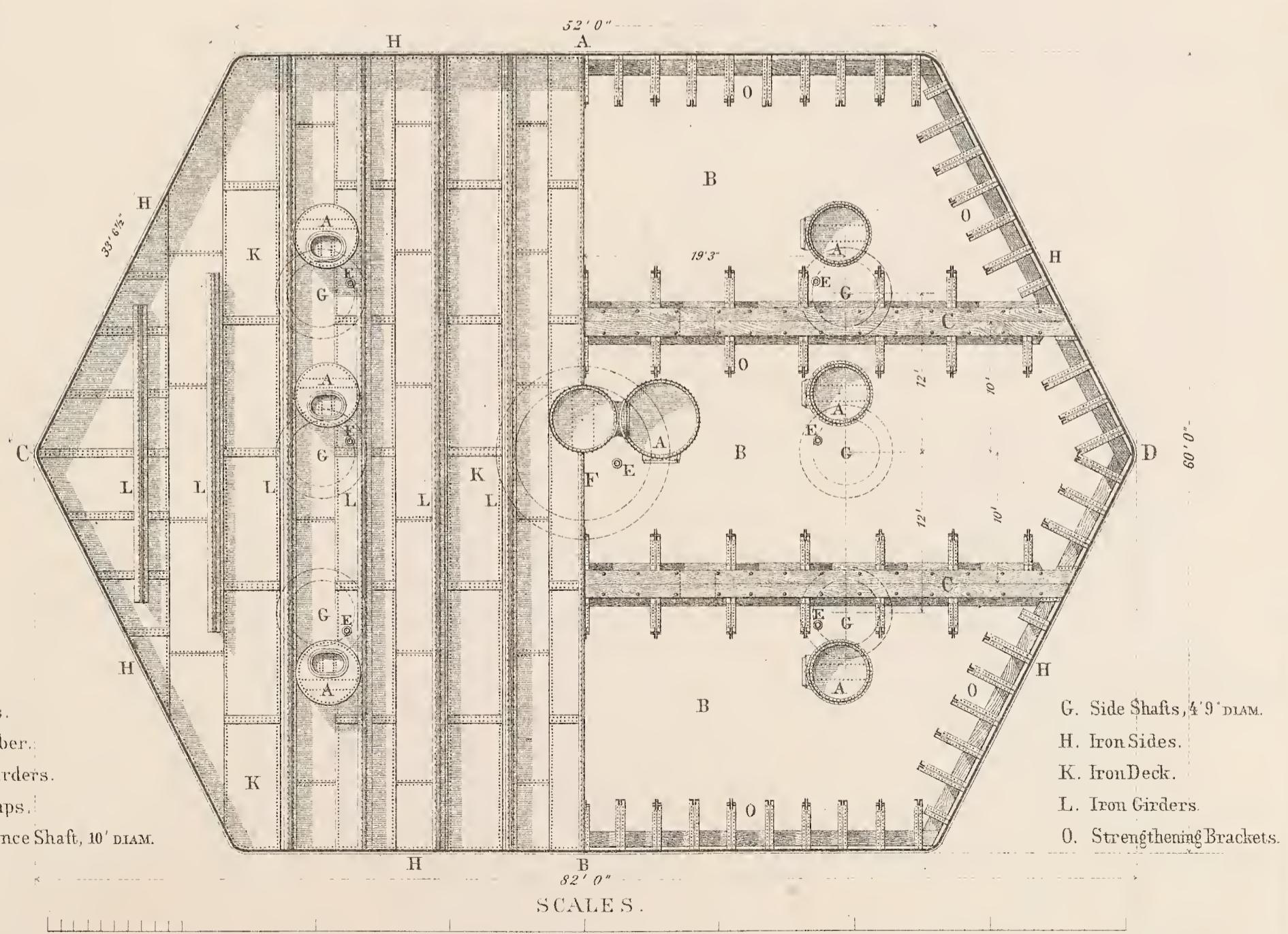


THE LIGHT LINES SHOW THE MAXIMUM STRAIN OR AREA WITHOUT REGARDING THE INFLUENCE OF TEMPERATURE.

SECTIONAL AREA REQUIRED FOR BRACES.

ALLOWED STRAINS=5 TONS PER SQ. IN.

CAISSON FOR EAST PIER.

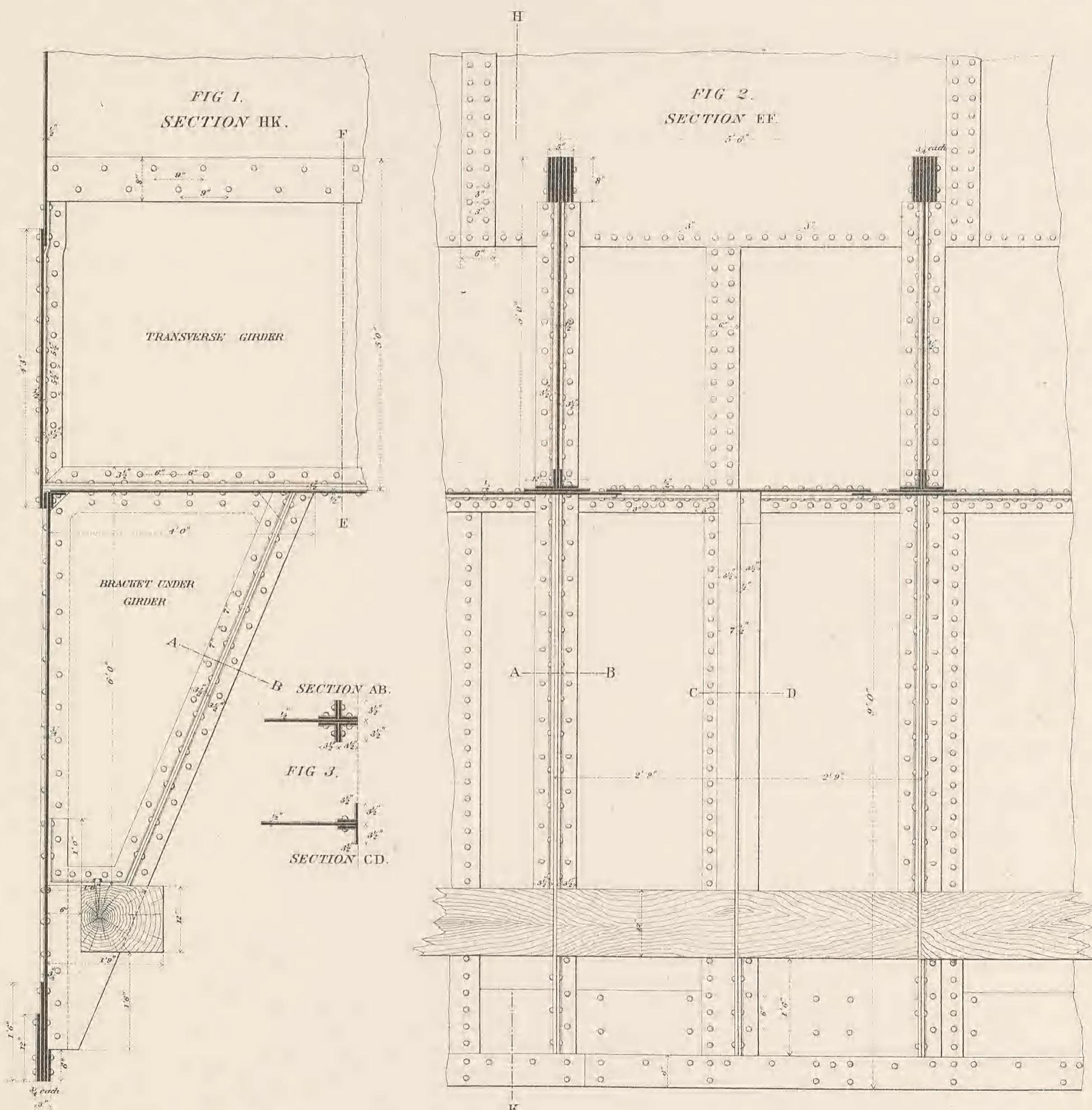
FIG. 1.
SECTION ALONG LINE CD.FIG. 2.
PLAN.
FIG. 3.
SECTION EF.

A. Air Locks.
B. Air Chamber.
C. Timber Girders.
E. Sand Pumps.
F. Main Entrance Shaft, 10' DIAM.

G. Side Shafts, 4' 9" DIAM.
H. Iron Sides.
K. Iron Deck.
L. Iron Girders.
O. Strengthening Brackets.

CAISSON FOR EAST PIER.

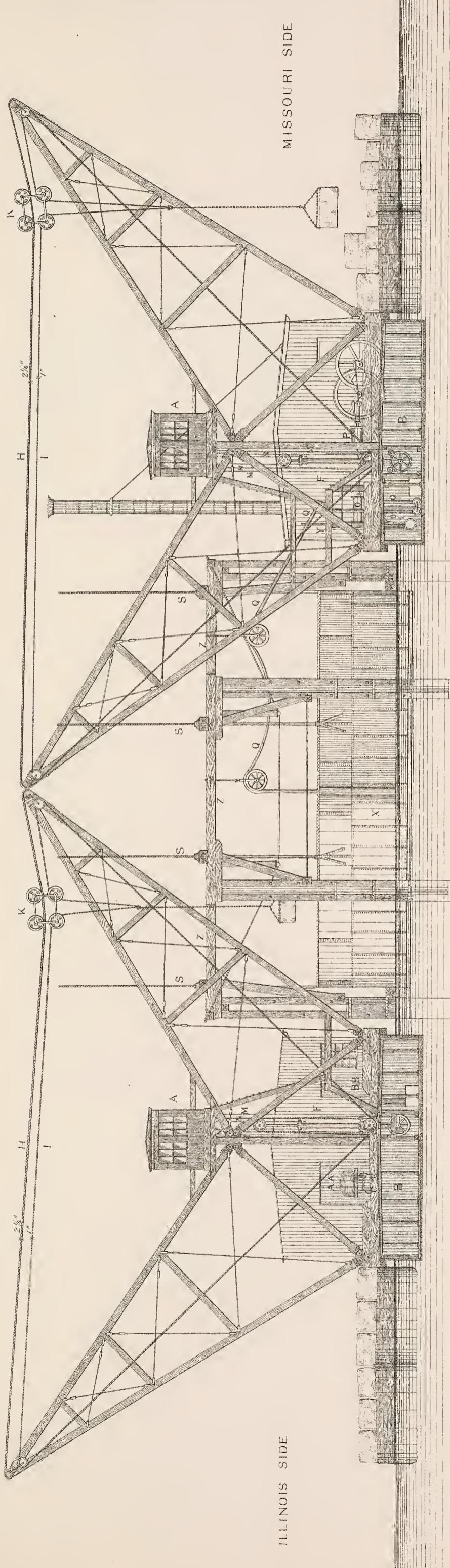
DETAILS OF IRON WORK.



SCALES.

INCHES. 12" 9" 6" 3" 0" 1" 2" 3" 4" 5" 6" 7" 8" 9" 10" METERS

VIEW LOOKING DOWN THE RIVER.



MISSISSIPPI

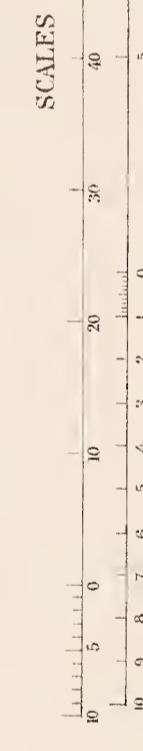
RIVER

CONSTRUCTION WORKS AND MACHINERY

FOR SINKING CAISSON AND LAYING MASONRY OF THE EAST PIER.

A. CABINS FOR OPERATORS OF PURCHASES
 B. PONTOONS
 F. HYDRAULIC JACKS FOR RAISING MATERIALS
 H. WIRE CABLES TO SUPPORT TRAVELING PURCHASES
 I. WIRE HOISTING ROPE
 K. TRAVELING PURCHASES
 M. SHAFTS FOR STARTING AND STOPPING TRAVELING PURCHASES
 N. VALVES FOR HYDRAULIC JACKS FOR RAISING AND LOWERING MATERIALS
 O. AIR PUMPS
 P. ENGINES TO DRIVE AIR PUMPS

Q. HOSE FOR SUPPLYING AIR
 S. SCREWS TO KEEP THE CAISSON LEVEL BEFORE REACHING SAND
 W. GUIDE PILES FOR CAISSON
 X. CAISSON
 Y. PIPES FOR WATER TO SAND PUMPS
 Z. TRUSSSES FOR GUIDE PILES
 AA. MIXING ROOM
 BB. OFFICE
 CC. TRAMWAYS FOR CEMENT AND STONE CARS

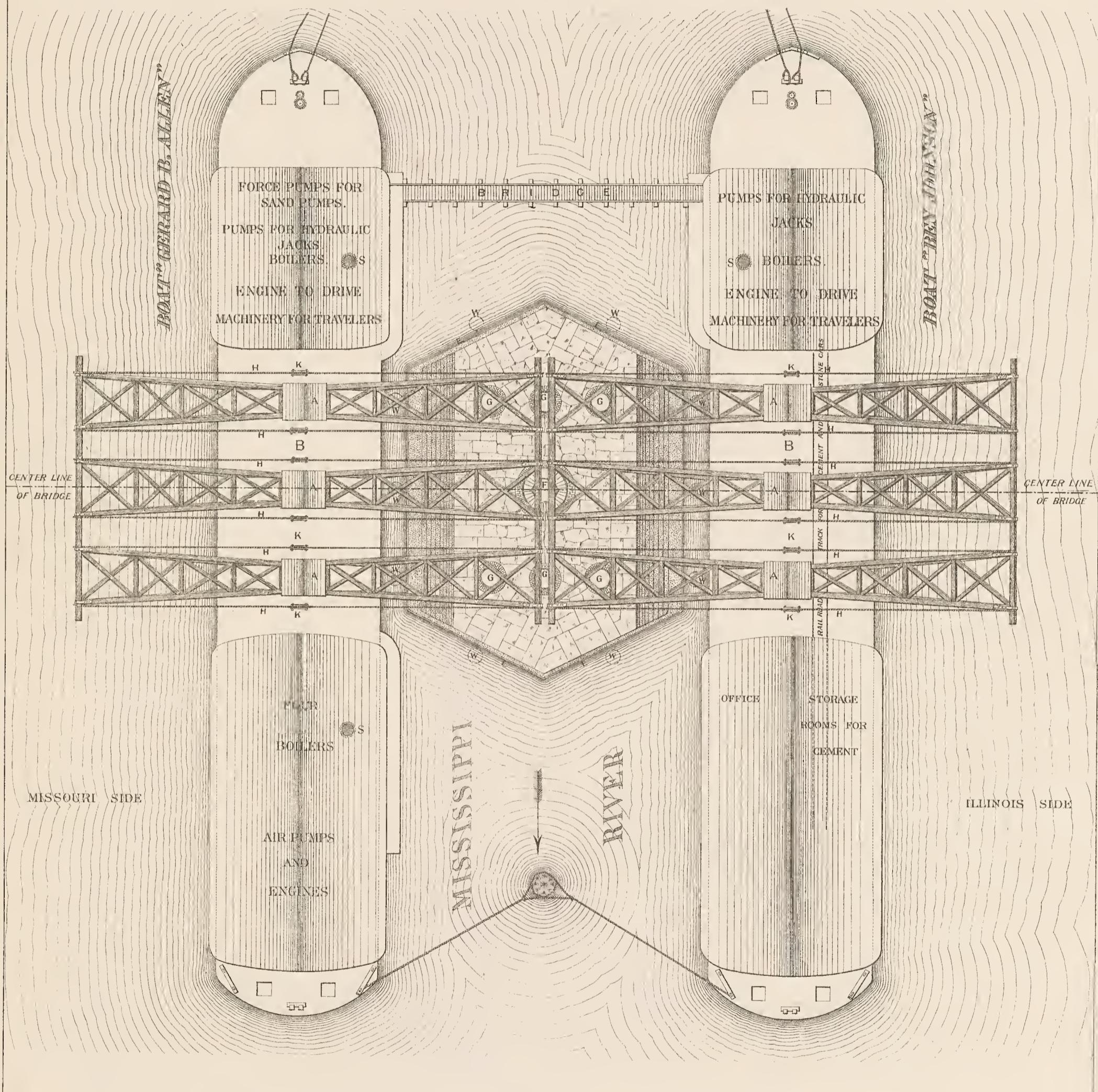


CONSTRUCTION OF EAST PIER.

PLAN OF
PONTOONS AND DERRICKS.

A CABINS FOR OPERATORS OF PURCHASES
 B PONTOONS
 F MAIN ENTRANCE SHAFT
 E IRON ENVELOPE OF CAISSON
 S SMOKE STACKS.

G SIDE SHAFTS TO AIR CHAMBER
 K TRAVELING PURCHASES
 H WIRE CABLE TO SUPPORT PURCHASES
 W GUIDE PILES



SCALES .

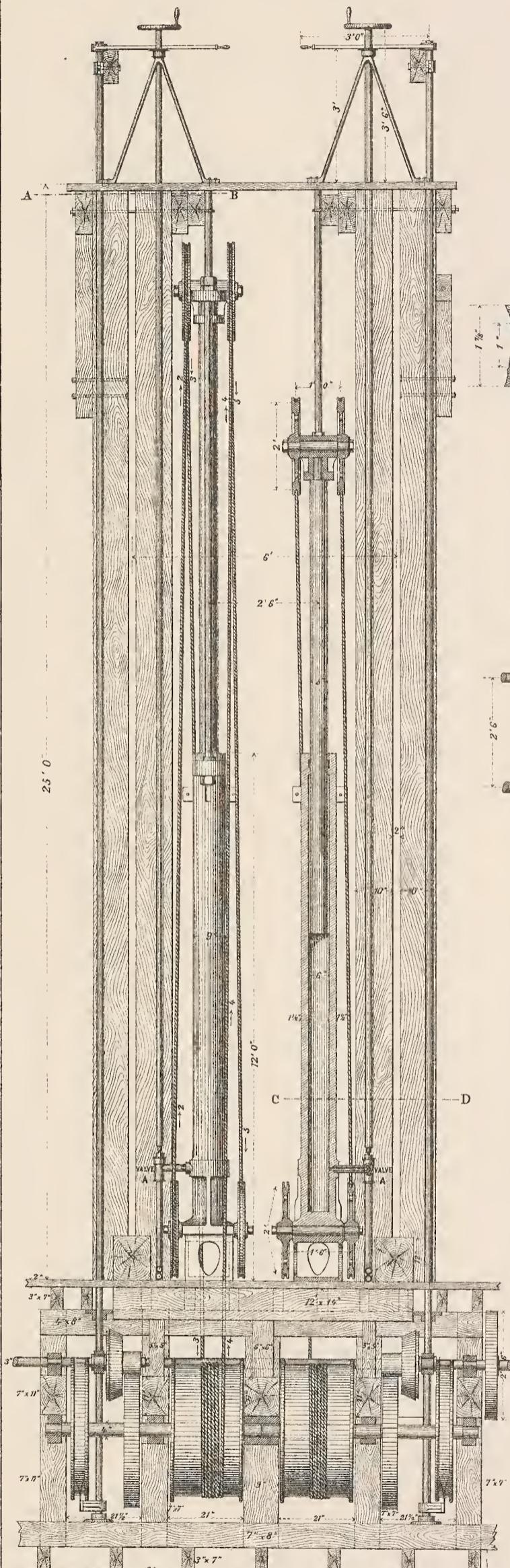
10 5 0 10 20 30 40 50 60 70 80 90 100 FEET

10 5 0 10 20 30 METRES

HYDRAULIC JACKS AND MACHINERY FOR DERRICKS.

FIG. 1.

SIDE ELEVATION.



VALVE "A" FOR HYDRAULIC JACKS.

SCALES.
INCHES 6 5 4 3 2 1 0 1/2 1 INCH.
CENTIMETRES 20 15 10 5 0

FIG. 6.

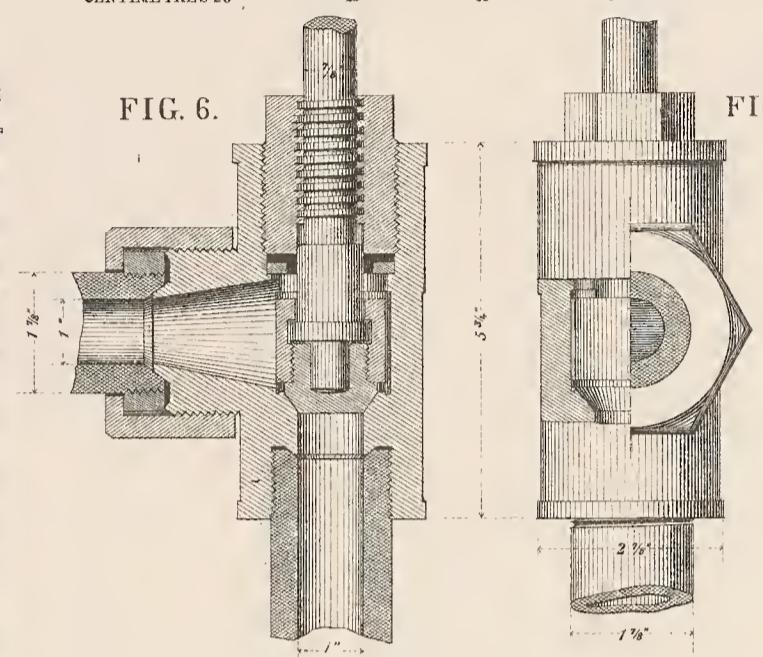


FIG. 7.

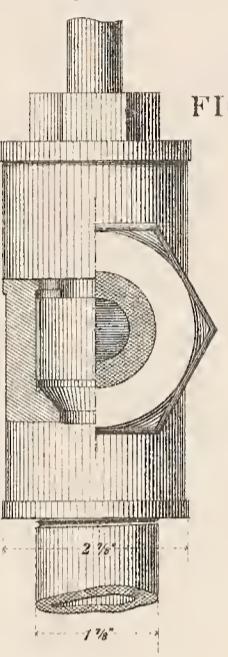
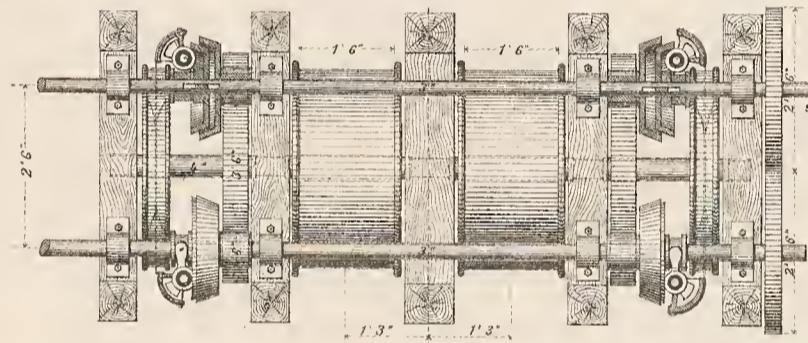
FIG. 3.
TOP-VIEW OF GEARING.

FIG. 4.

TOP-VIEW OF CABIN PLATFORM SHOWING LEVERS
TO OPERATE GEARING AND WHEELS FOR VALVES.

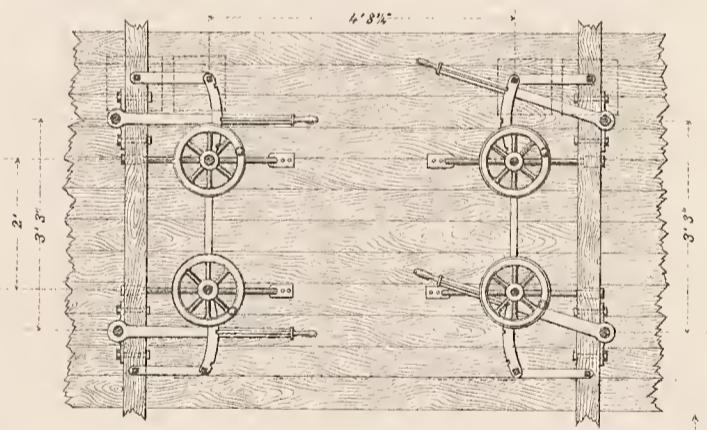
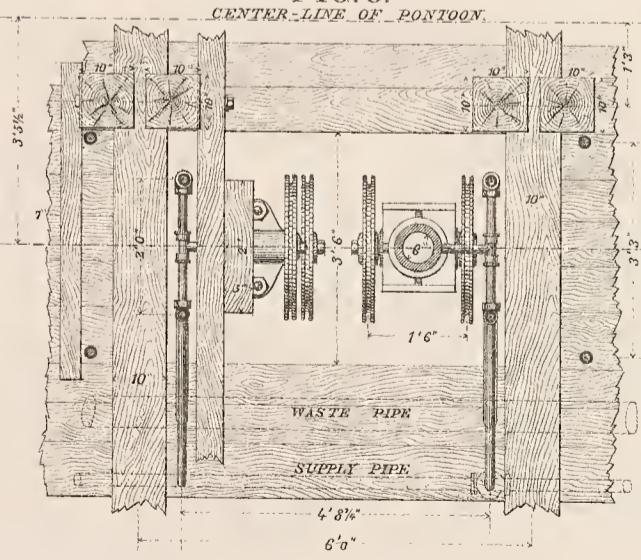


FIG. 5.

SECTION AB. SECTION CD.
LOOKING DOWNWARD.

SCALE OF FEET.



SCALE OF METRES.

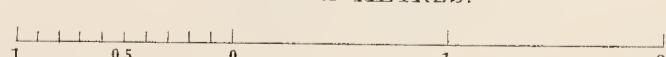
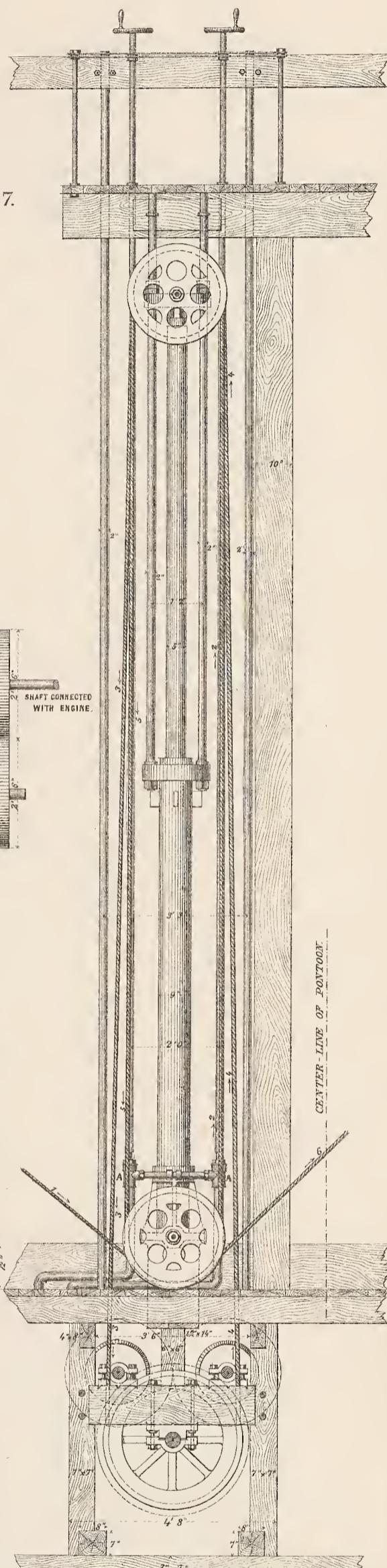


FIG. 2.

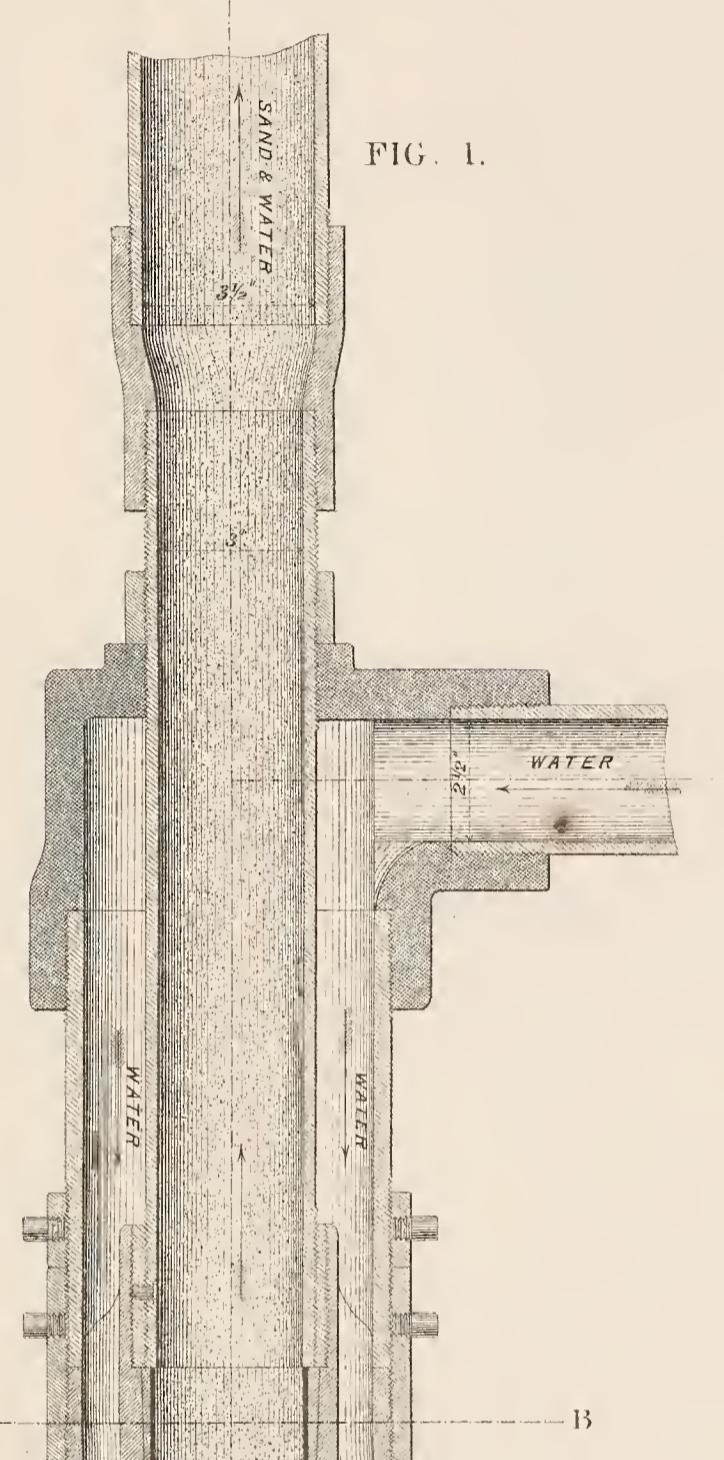
ELEVATION.



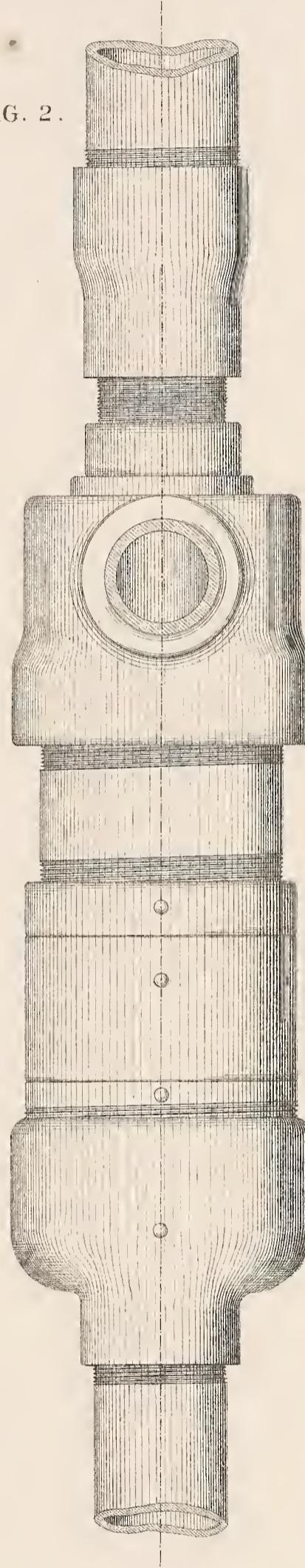
SANDPUMP.

0 3 6 9 12 18 24 INCHES.
10 5 0 10 20 30 40 50 CENTIMETRES.

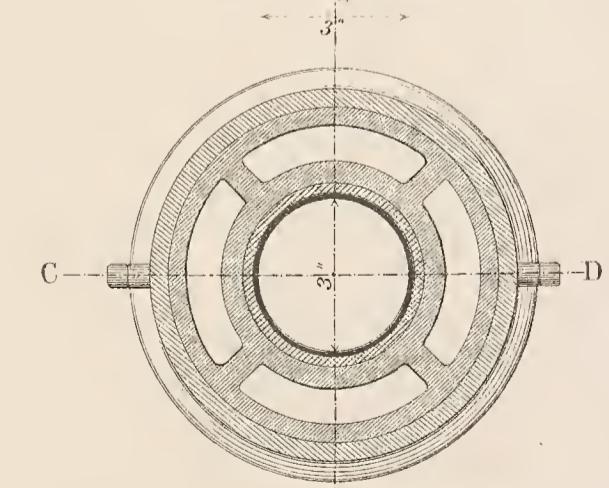
SECTION CD.



SIDE ELEVATION.



A - - - - - B



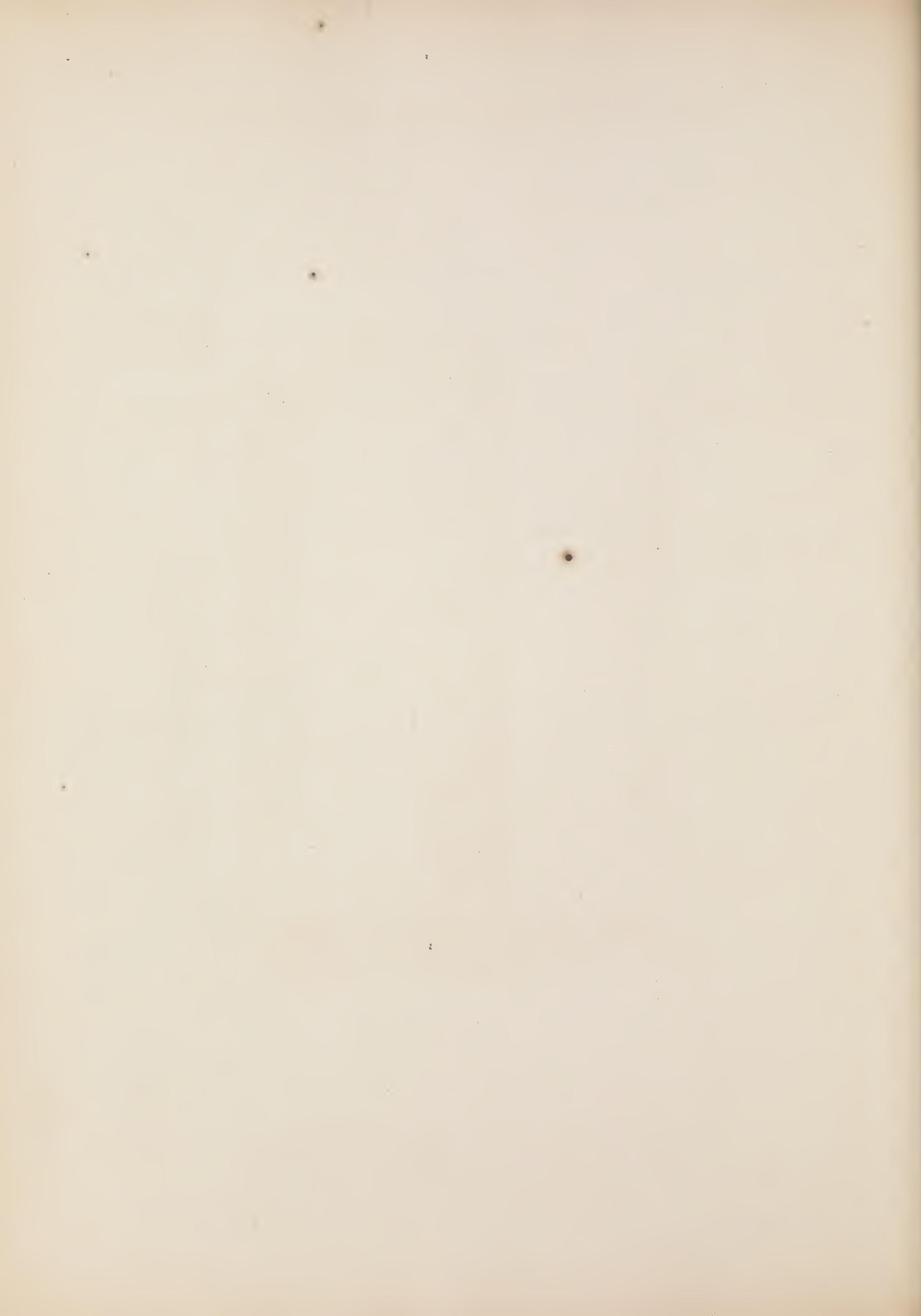
SECTION AB.

BRASS.

WROUGHT IRON.

CAST IRON.

CHILLED IRON.

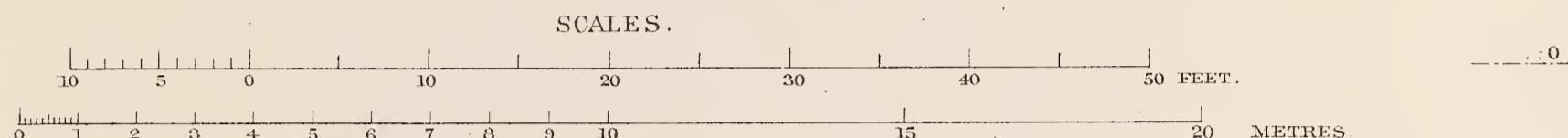


SECTION OF EAST PIER AND CAISSON

ON LINE AB, PLATE VII.

Extreme High Water. SHOWING THE INTERIOR OF THE MAIN ENTRANCE SHAFT AND AIR CHAMBER
AND THE WORKING OF ONE OF THE SAND PUMPS. +7'58'

City Directrix.



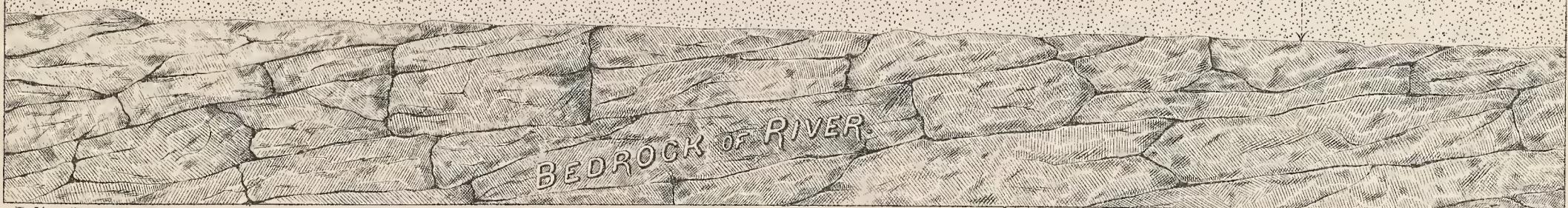
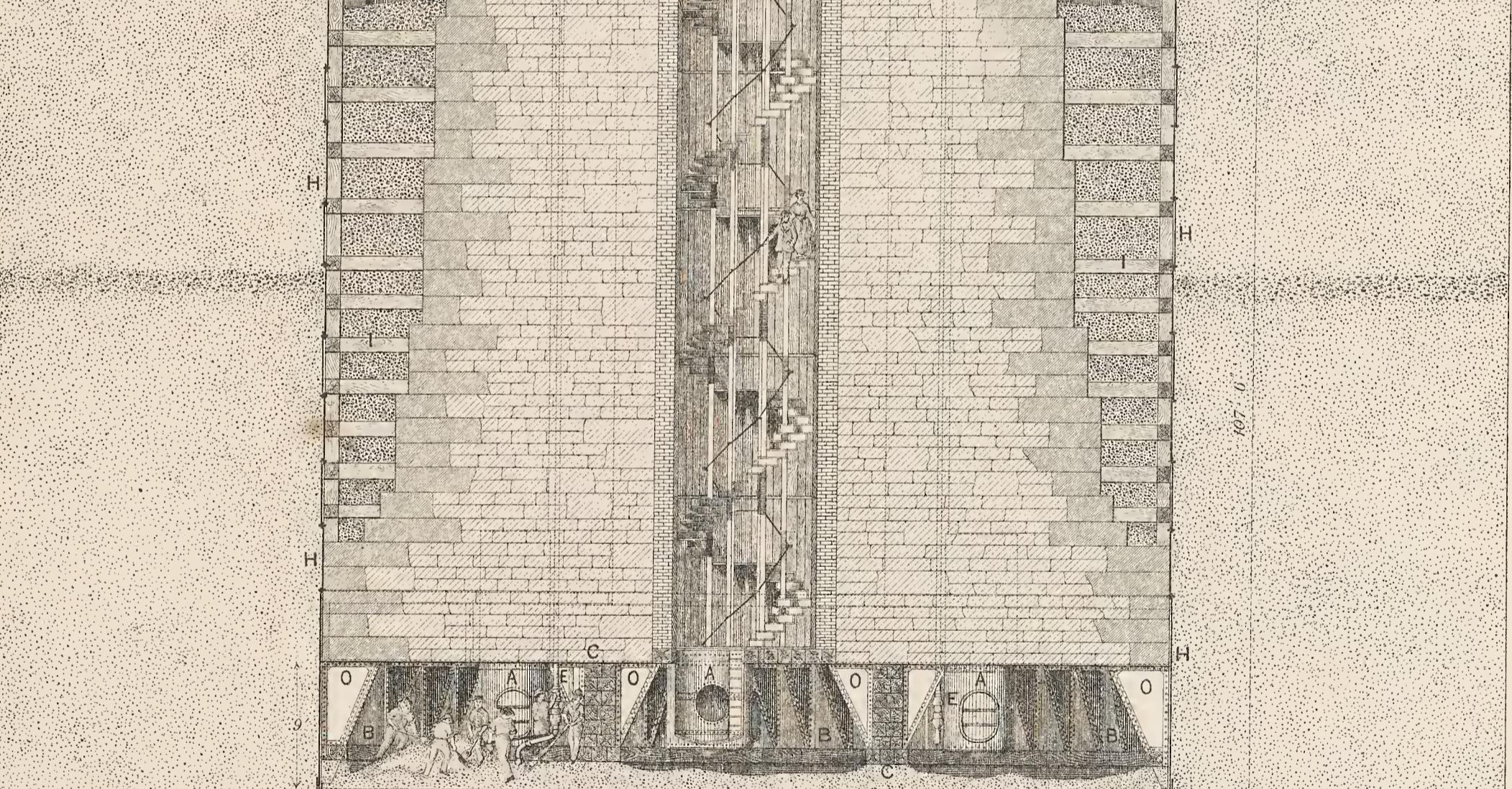
A. Air Locks.
B. Air Chamber.
C. Timber Girder.
D. Discharge of Sand Pump.
E. Sand Pumps.

F. Main Entrance Shaft.
G. Side Shafts.
H. Iron Envelope.
I. Bracing for Shell.
O. Strengthening Brackets.

Ordinary Water Line.

Extreme Low Water

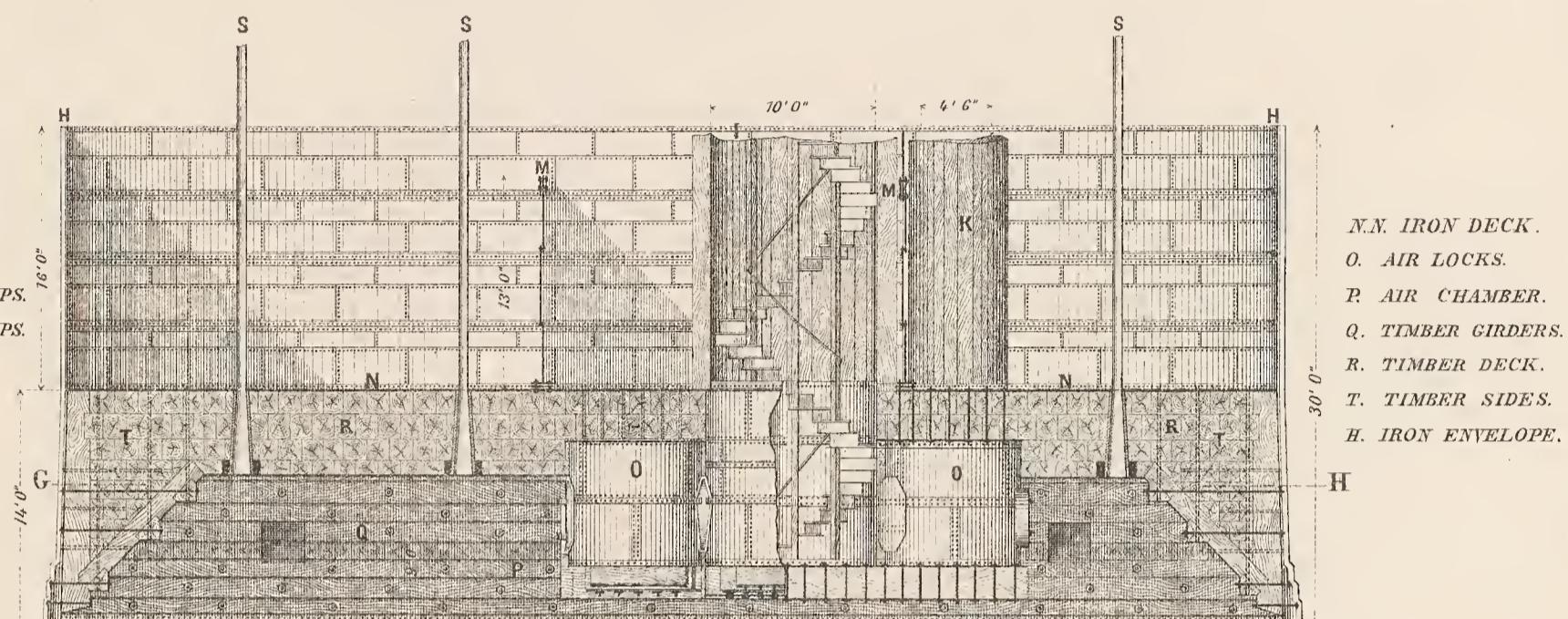
Upper Line of Sand Bed



CAISSON FOR EAST ABUTMENT.

FIG. 1.

SECTION OF CAISSON ALONG LINE AB.



TOP - VIEW
OF
CAISSON.
SECTION
ALONG
LINE GH.

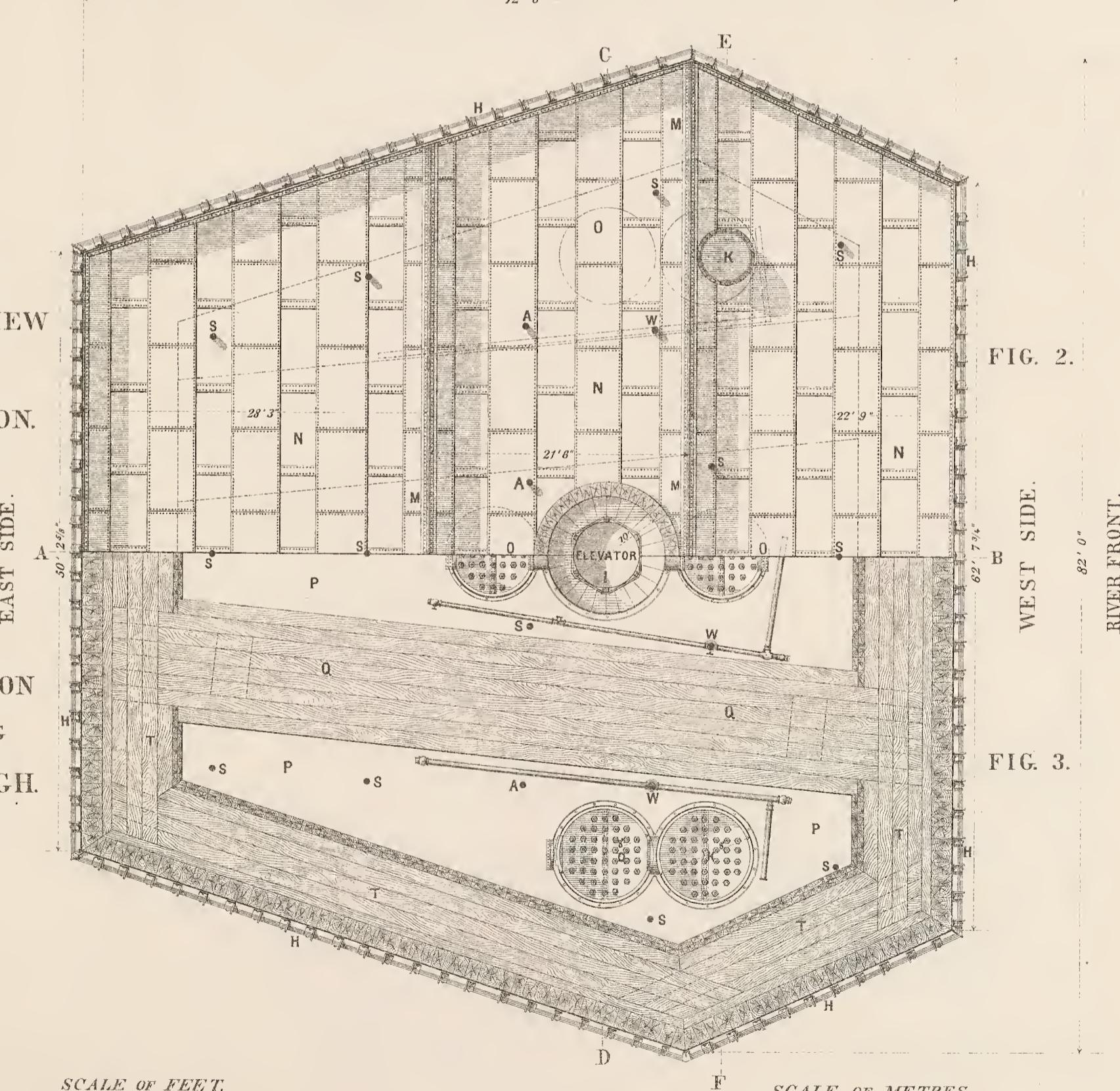


FIG. 2.

WEST SIDE.
RIVER FRONT.

FIG. 3.

CAISSON FOR EAST ABUTMENT.

FIG. 1.

FIG. 2.

SECTION OF CAISSON

ALONG LINE C D,

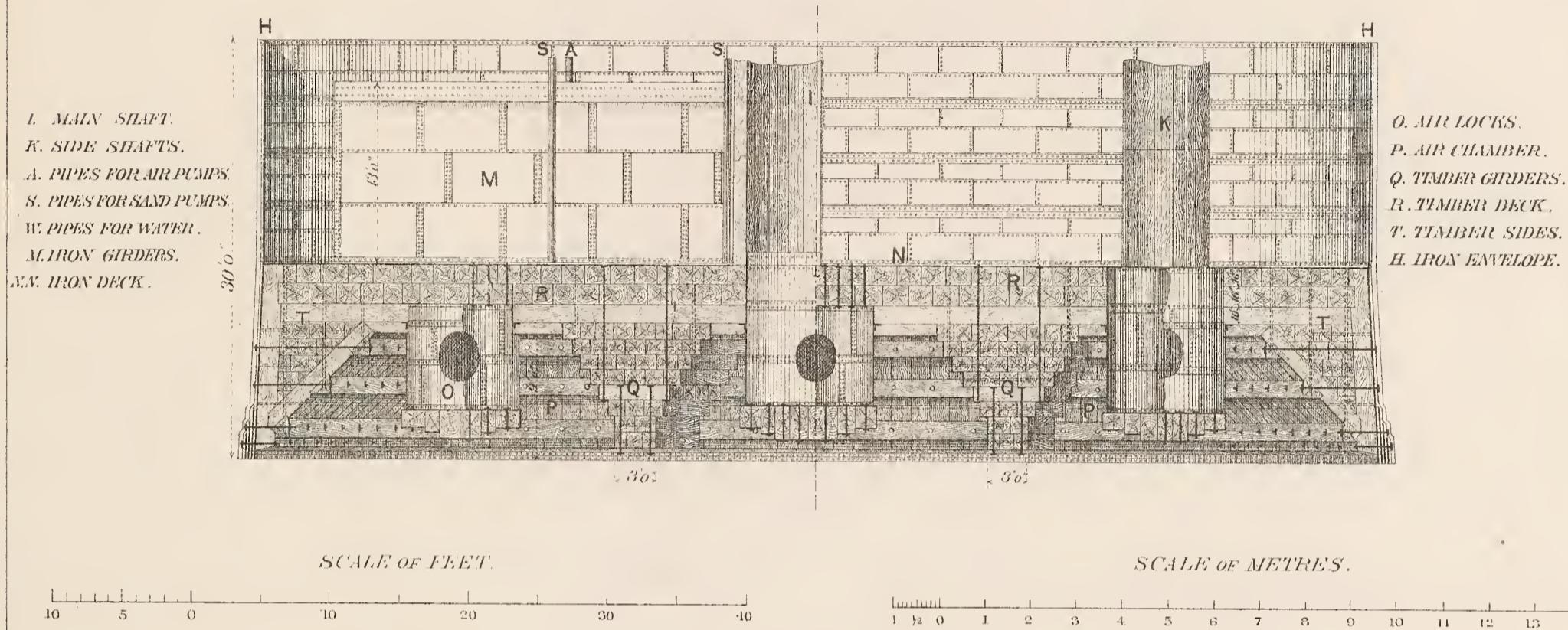
(Plate VII.)

LOOKING EASTWARD.

ALONG LINE E F.

(Plate VII.)

LOOKING WESTWARD.



CENTRAL AIR LOCKS.

FIG. 3.

ELEVATION.

FIG. 4.

SECTION XX.

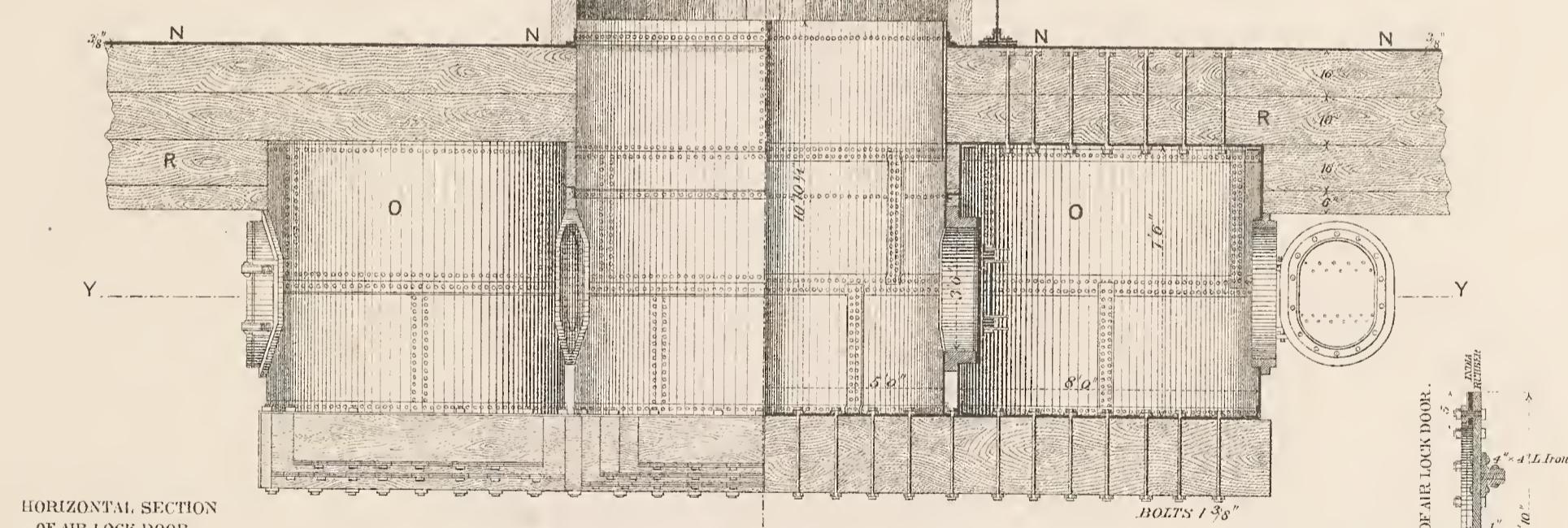
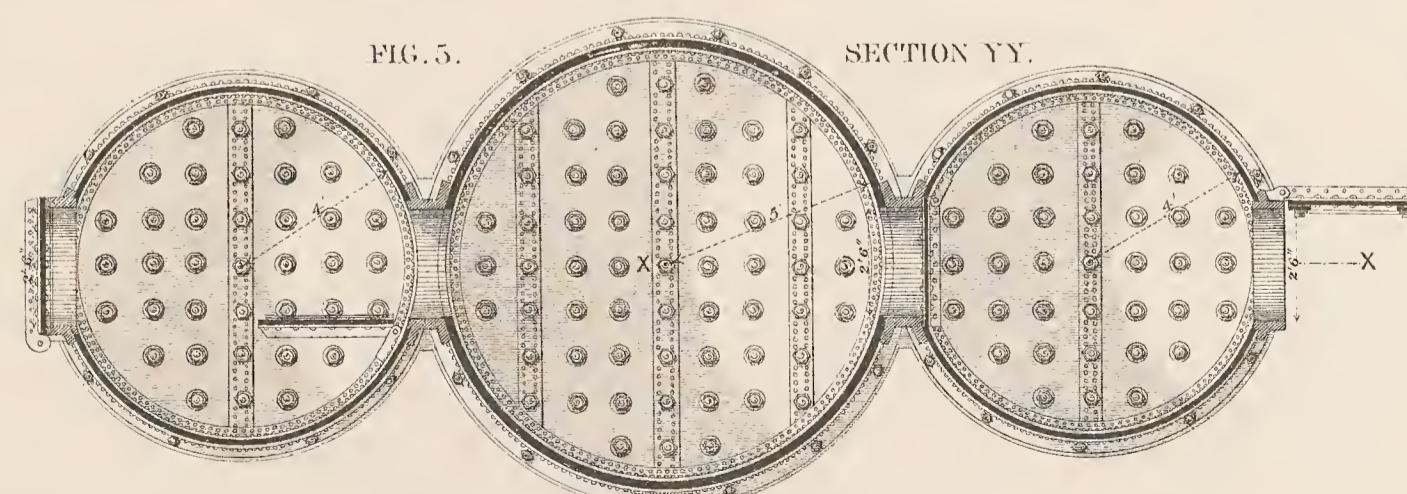
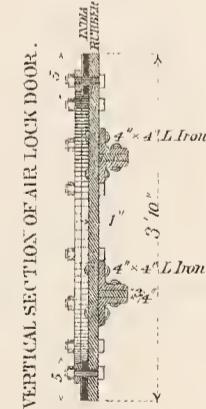


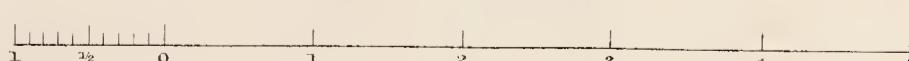
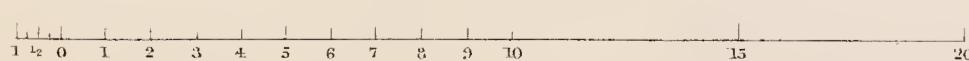
FIG. 5.

SECTION YY.



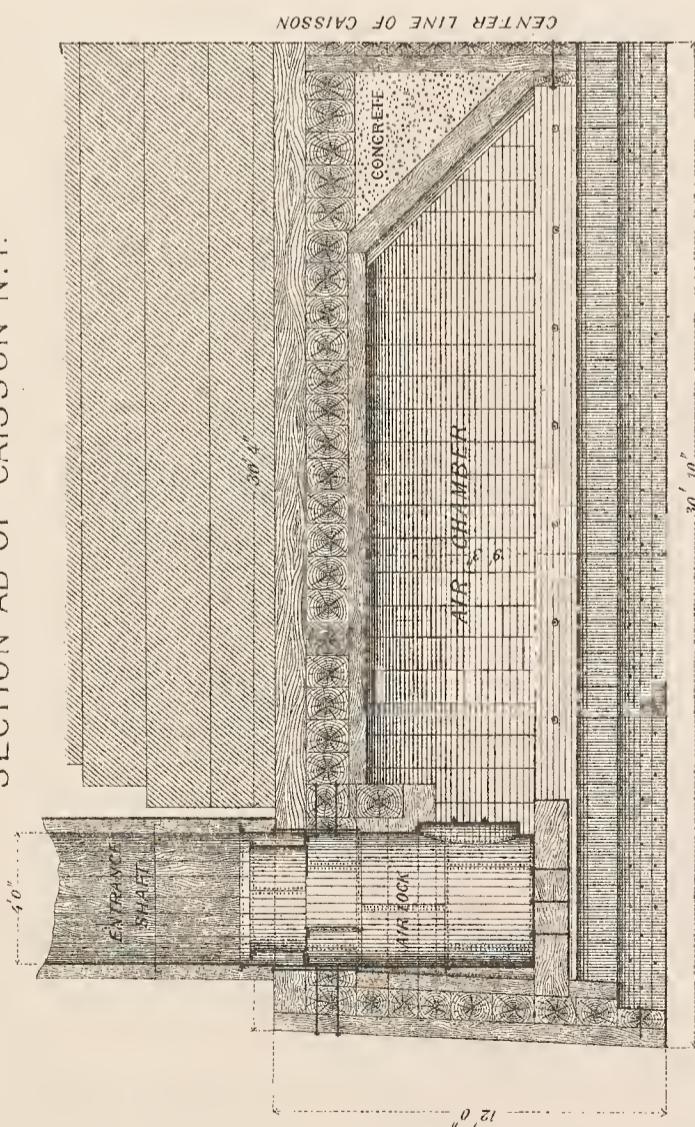
SCALE OF FEET.

SCALE OF METRES.



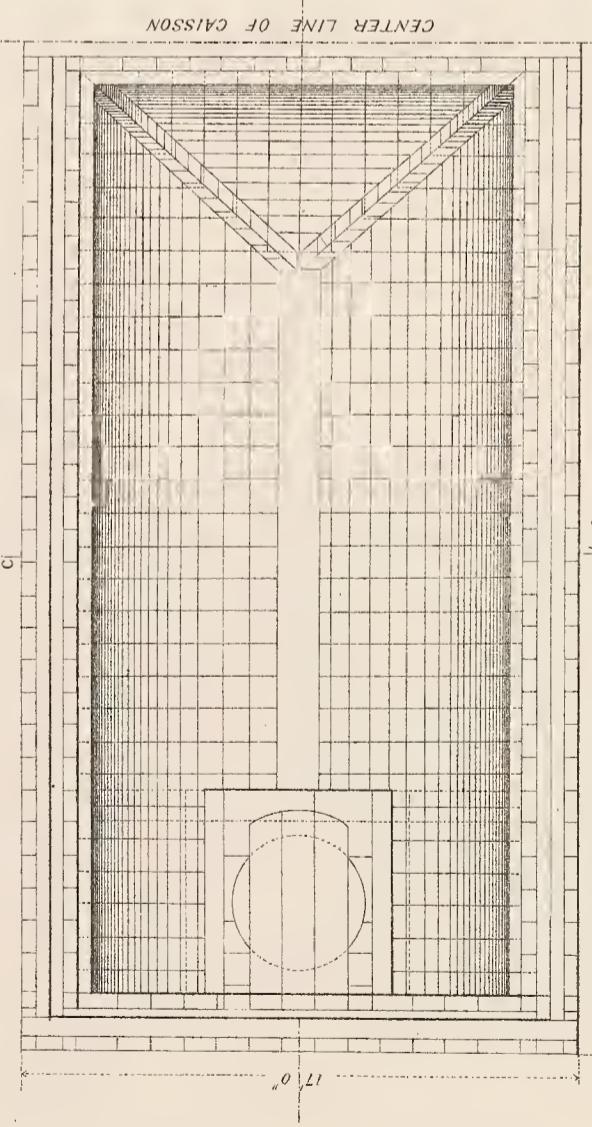
CAISSONS FOR PIERS OF EAST APPROACH.

FIG. 1.
SECTION AB OF CAISSON N^o.I.



THE OTHER HALF OF CAISSON IS SYMMETRICAL.

FIG. 3.
VIEW OF CAISSON N^o.I FROM BELOW.

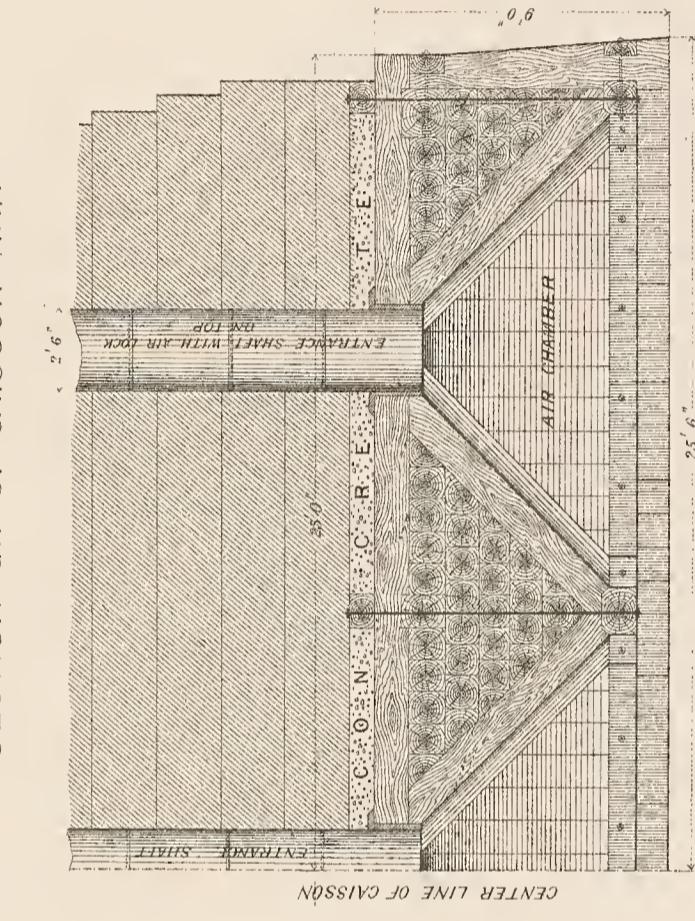


CAISSON I WAS USED AT APPROACH PIERS N^o. 1, 2 & 4.
CAISSON II WAS USED AT APPROACH PIER N^o. 3.

SCALE OF FEET
24 21 18 15 12 9 6 3 0 8 1
FOOT

SCALE OF METRES
10 9 8 7 6 5 4 3 2 1 0
METRE

FIG. 4.
SECTION GH OF CAISSON N^o.II.



THE OTHER HALF OF CAISSON IS SYMMETRICAL.

FIG. 5.
VIEW OF CAISSON N^o.II FROM BELOW.

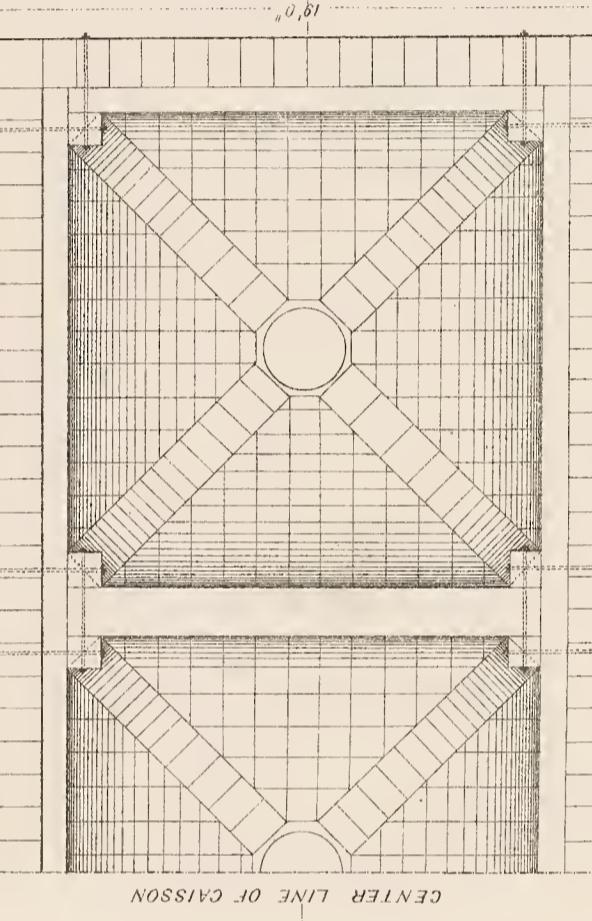


FIG. 2.
SECTION CD OF CAISSON N^o.I.

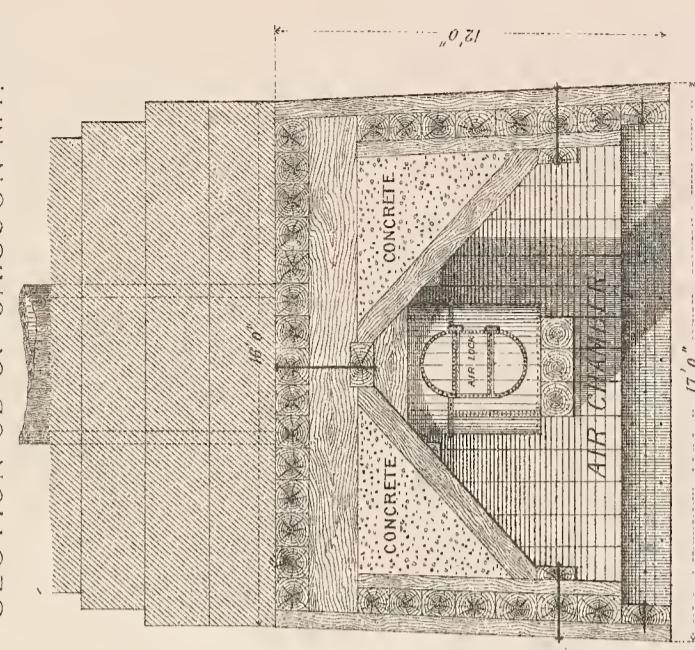
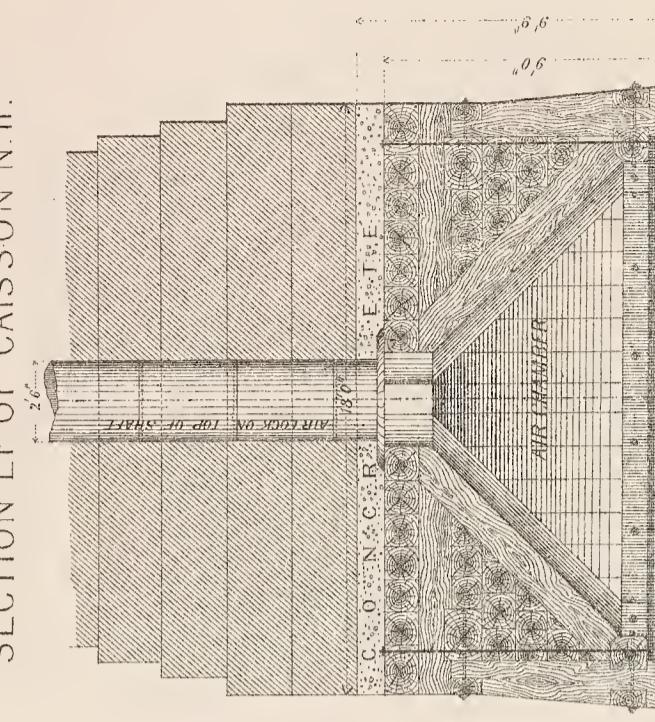


FIG. 6.
SECTION EF OF CAISSON N^o.II.



ABUTMENT AND WEST APPROACH.

FIG. 1.
ELEVATION.

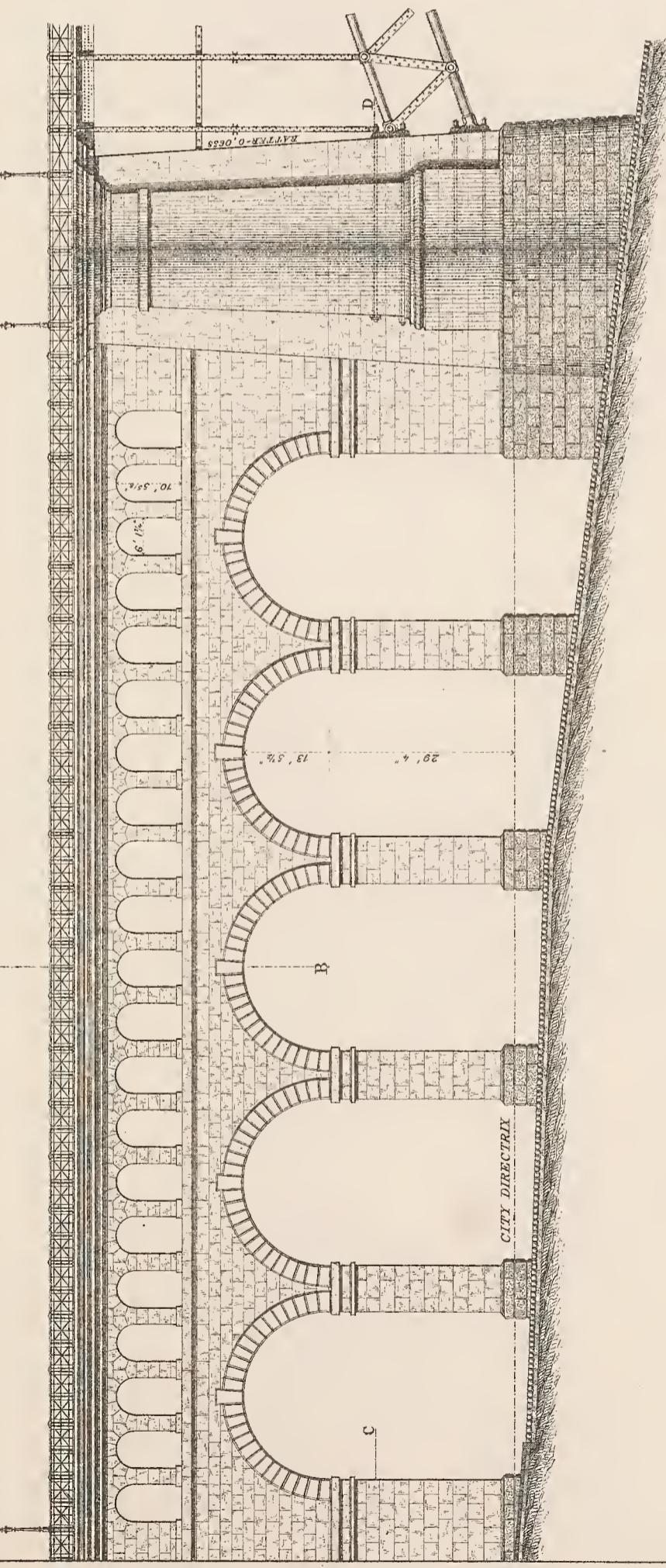


FIG. 2.
SIDE VIEW.

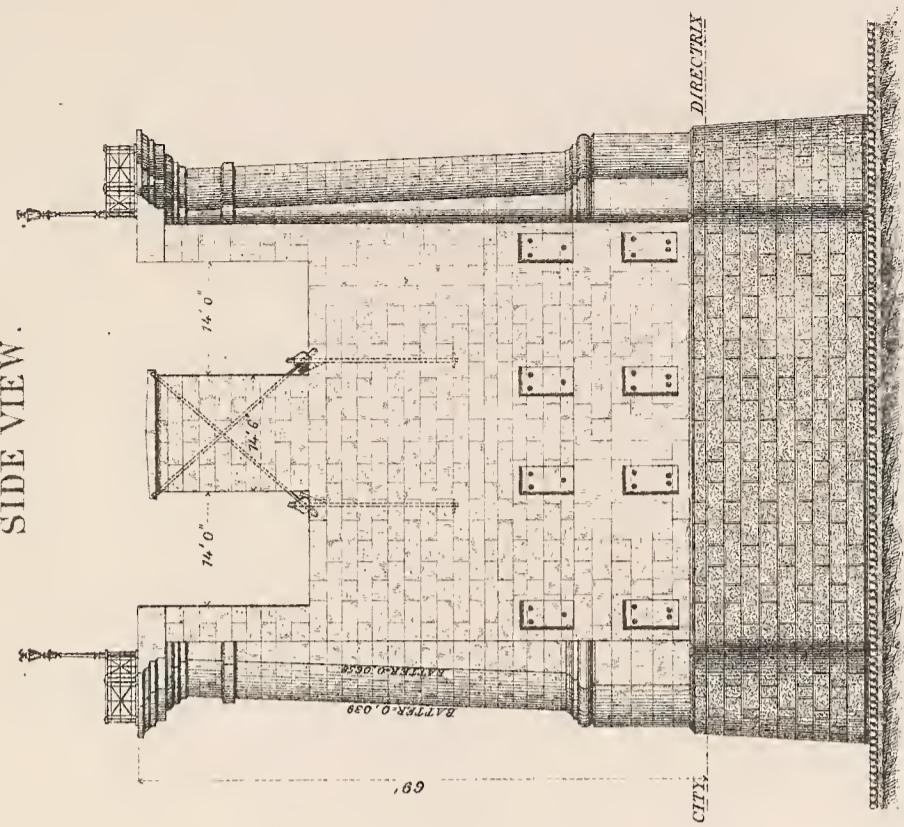


FIG. 4.
SECTION AB.

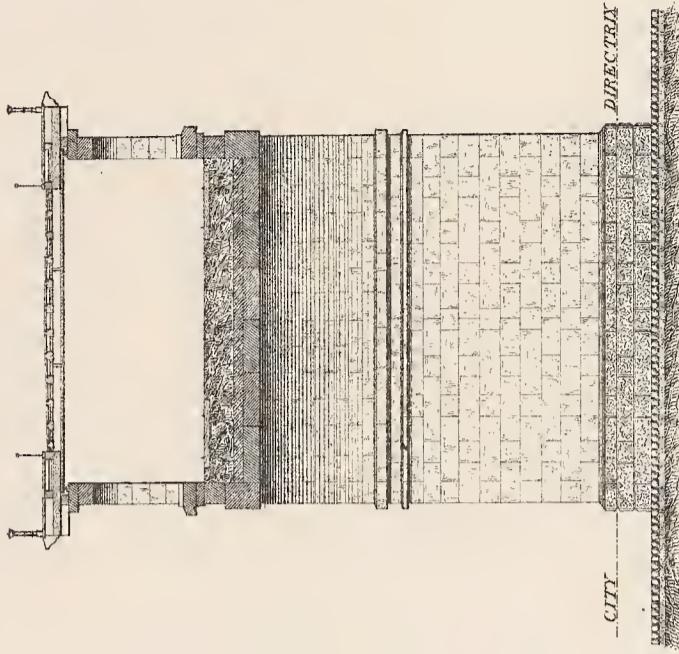
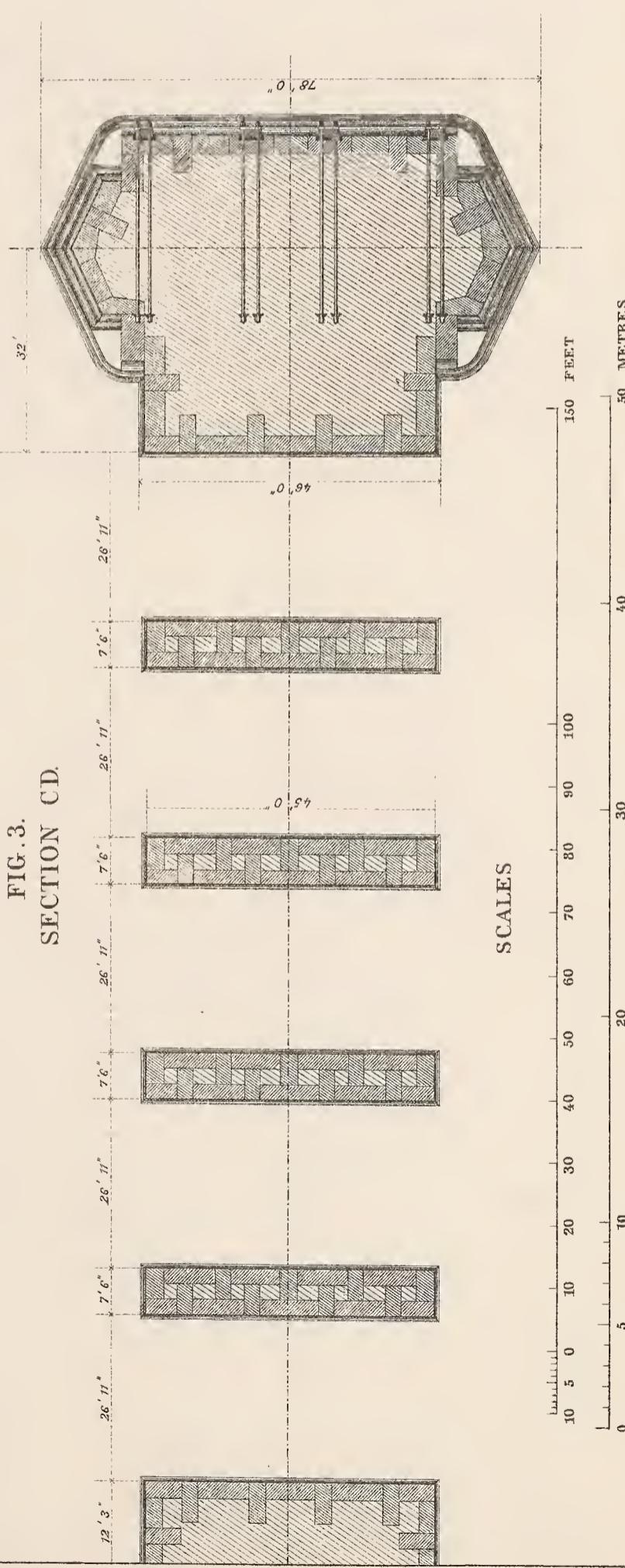


FIG. 3.
SECTION CD.



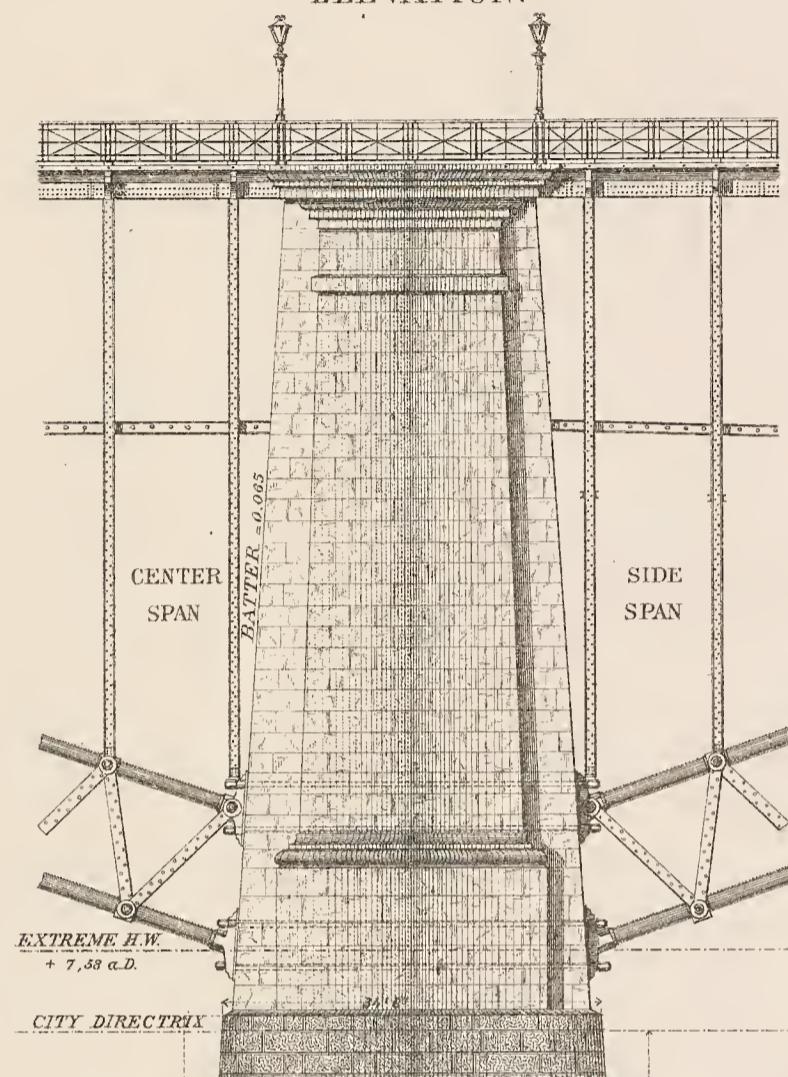
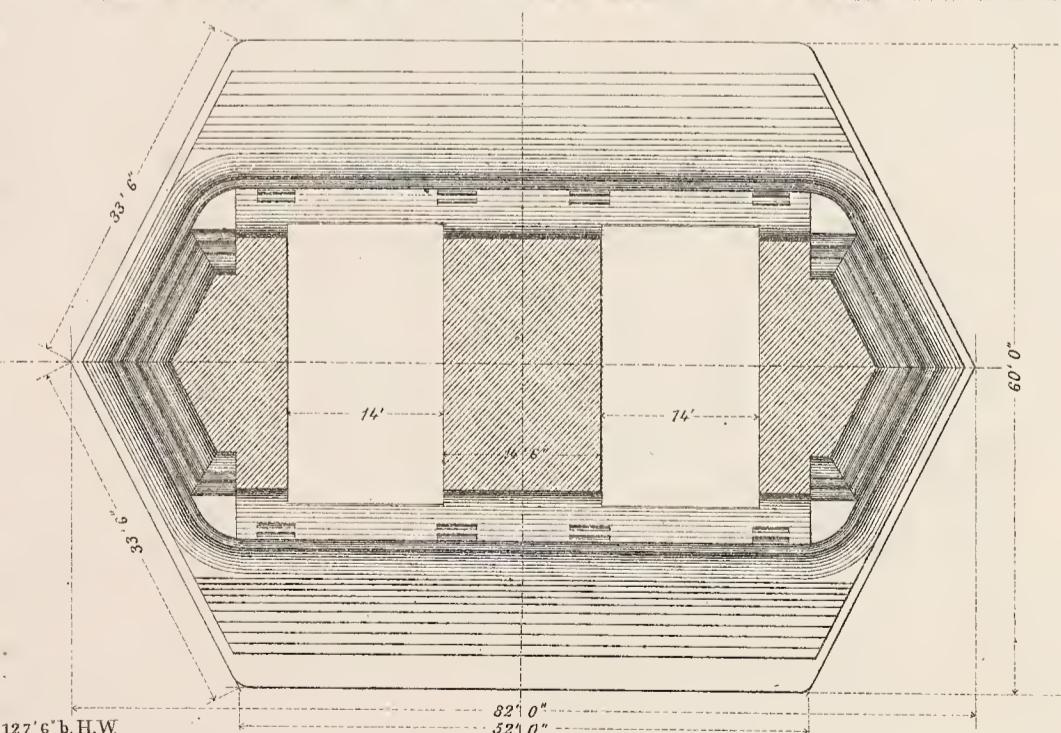
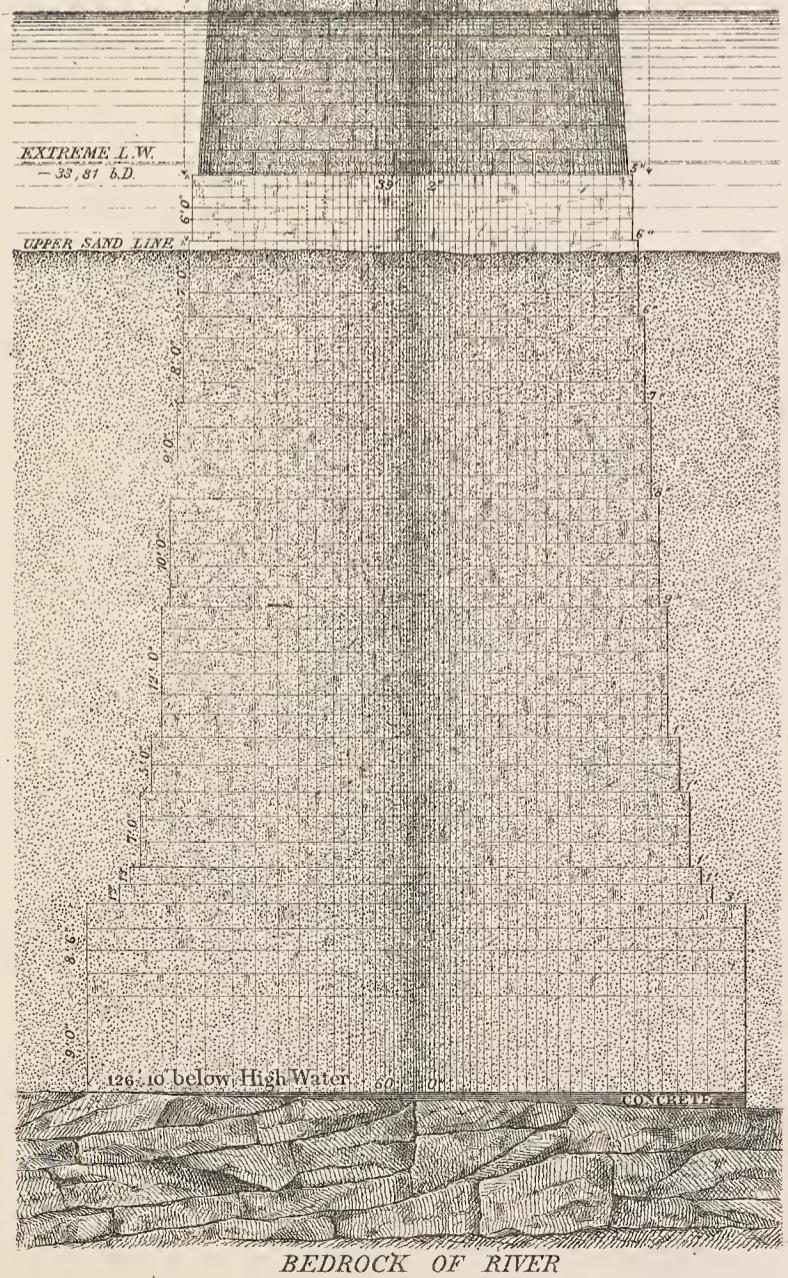
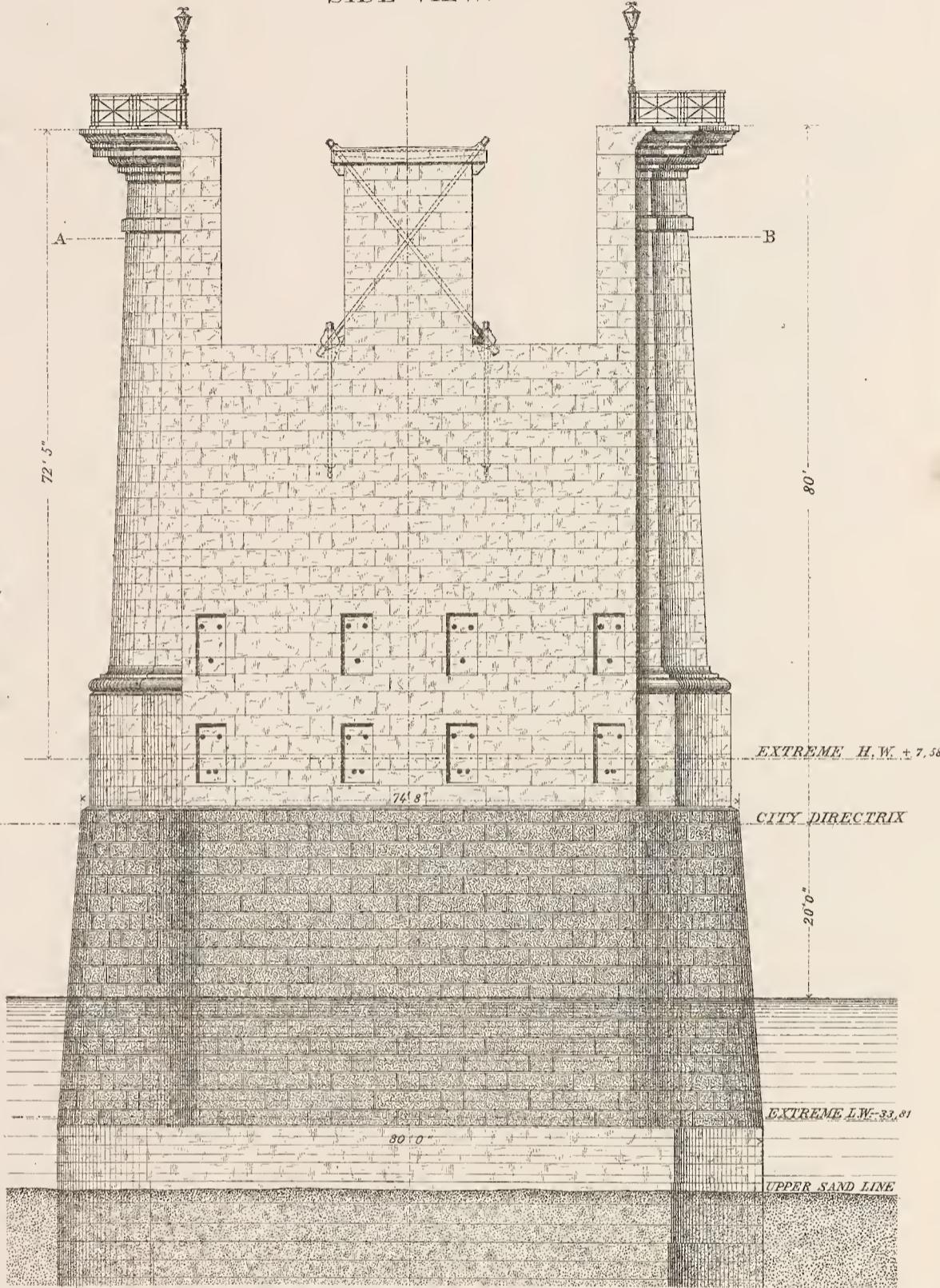
Julius Bien lith. N.Y.

EAST PIER.

SCALES

10 5 0 10 20 30 40 50 FEET

10 9 8 7 6 5 4 3 2 1 0 5 10 METRES

FIG. 1.
ELEVATION.FIG. 2.
SIDE VIEW.SECTION AB.
FIG. 3.

ELEVATION OF ONE-HALF OF
CENTER SPAN.

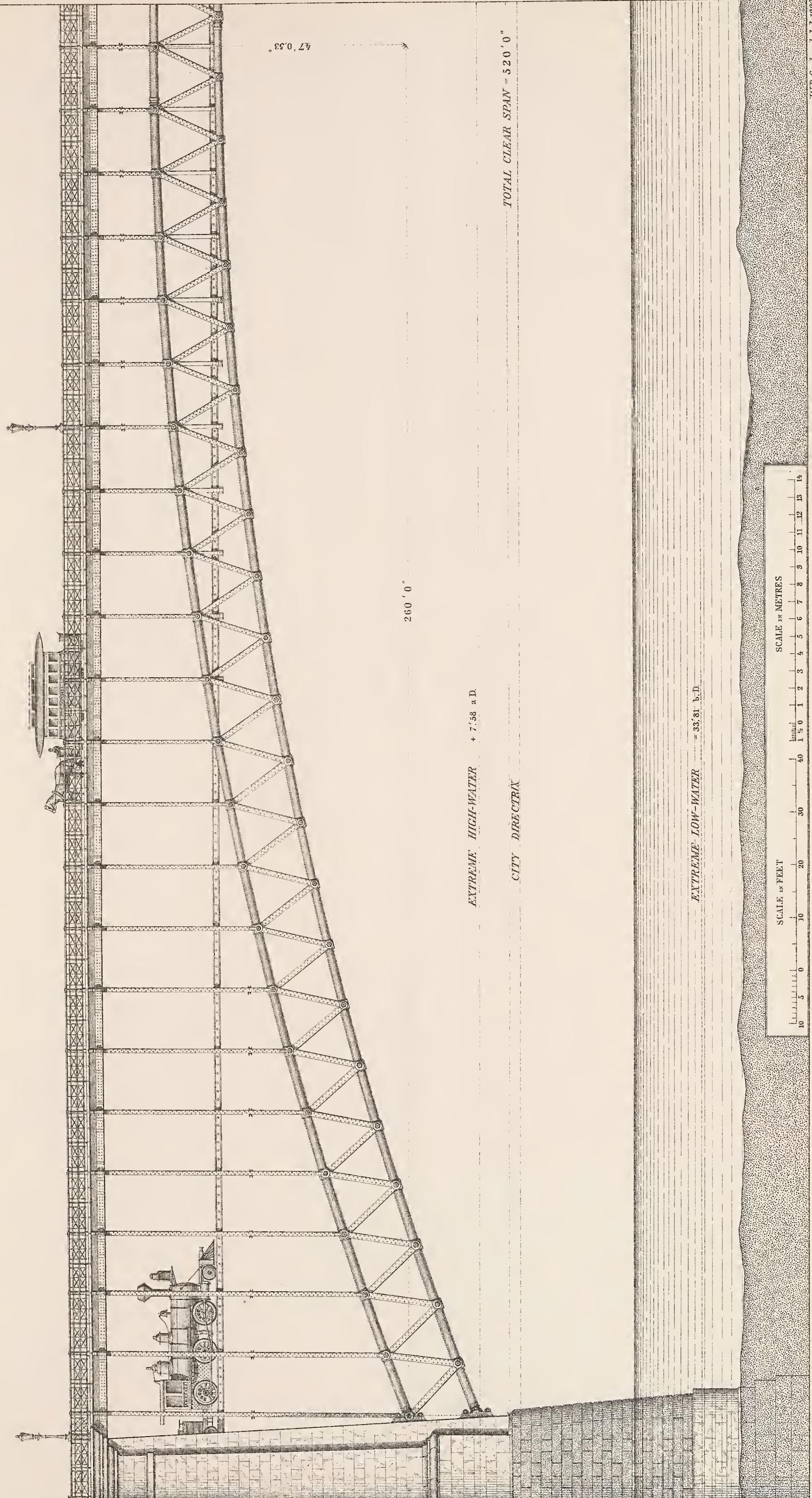
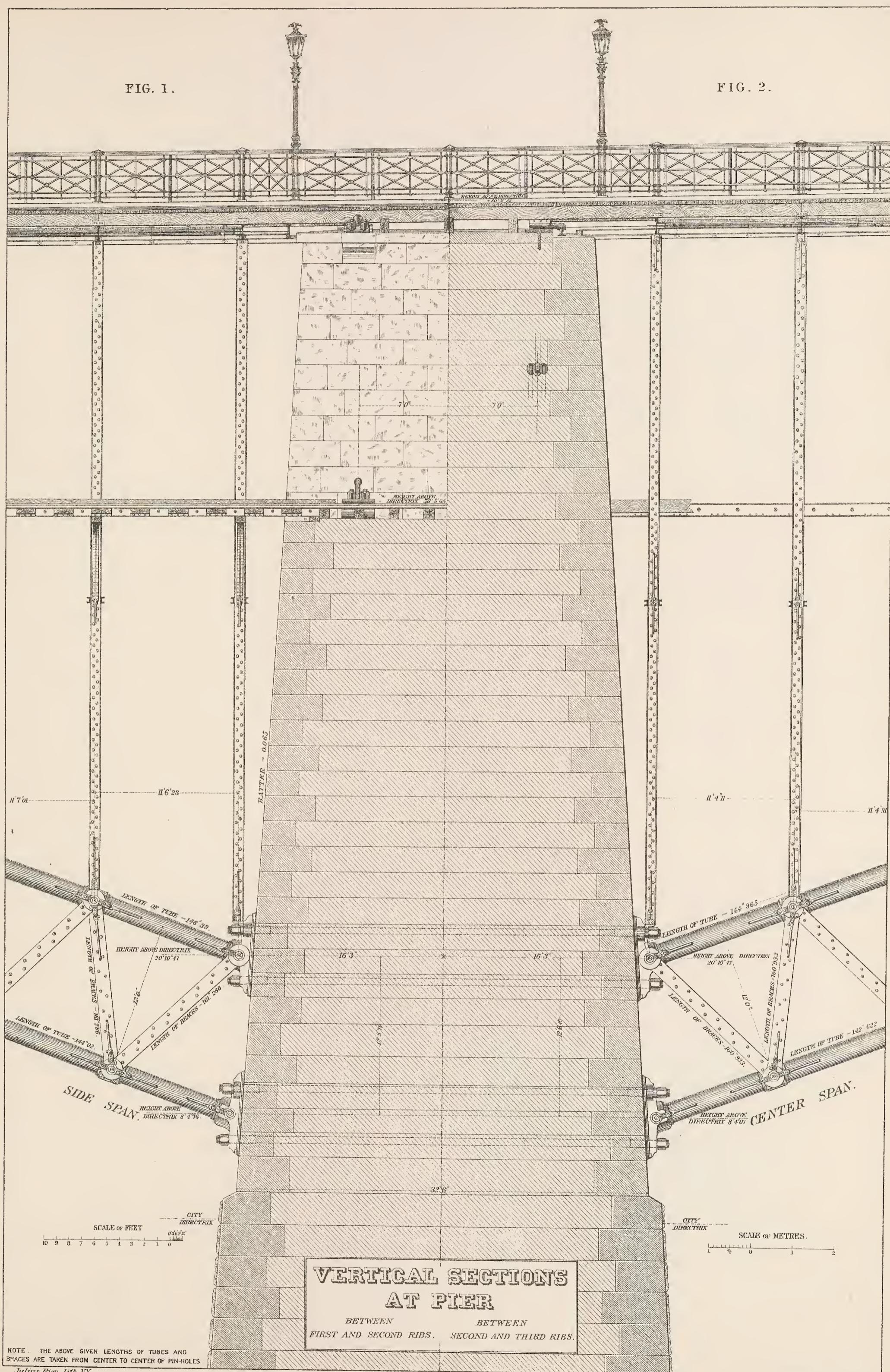
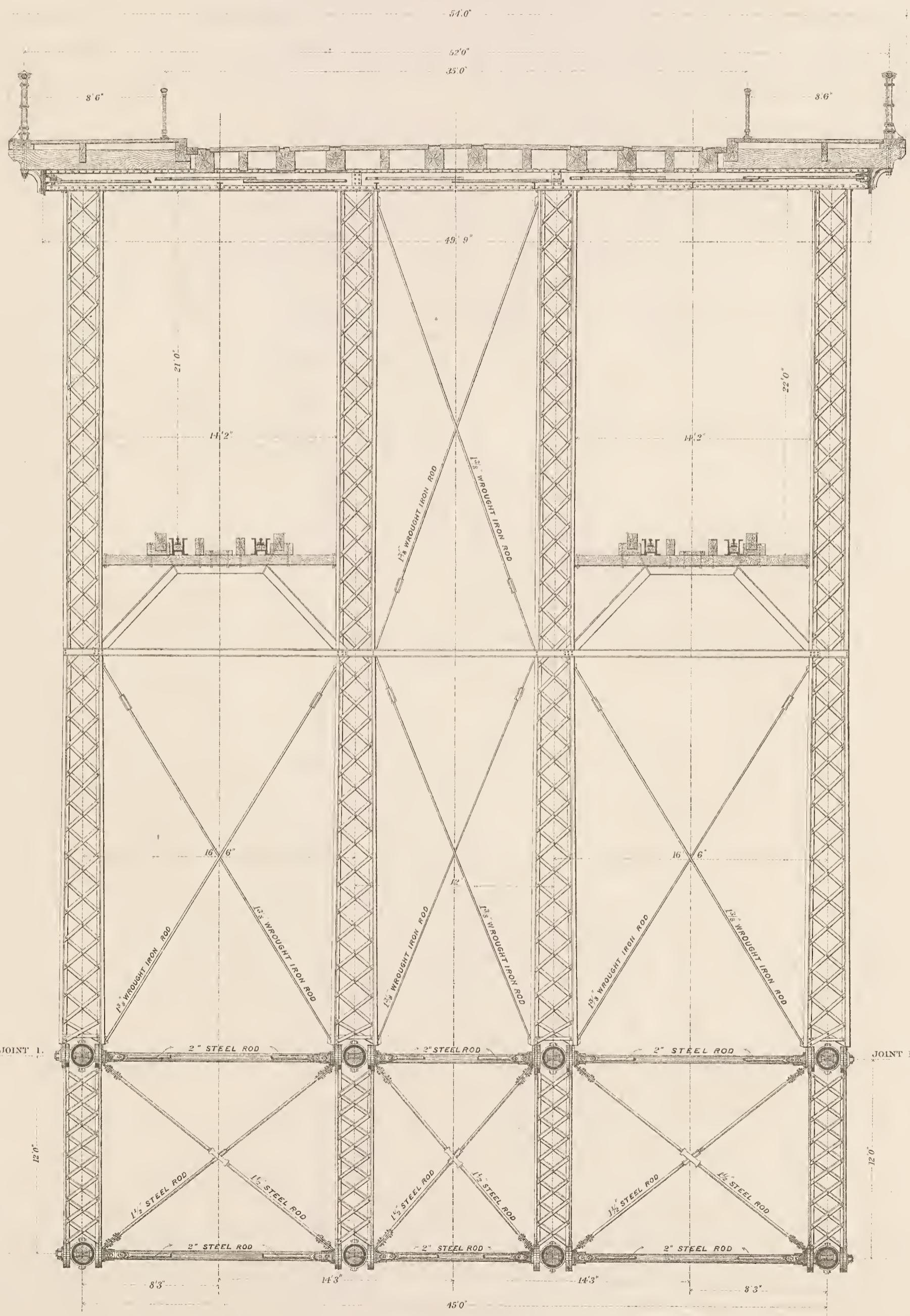


FIG. 1.

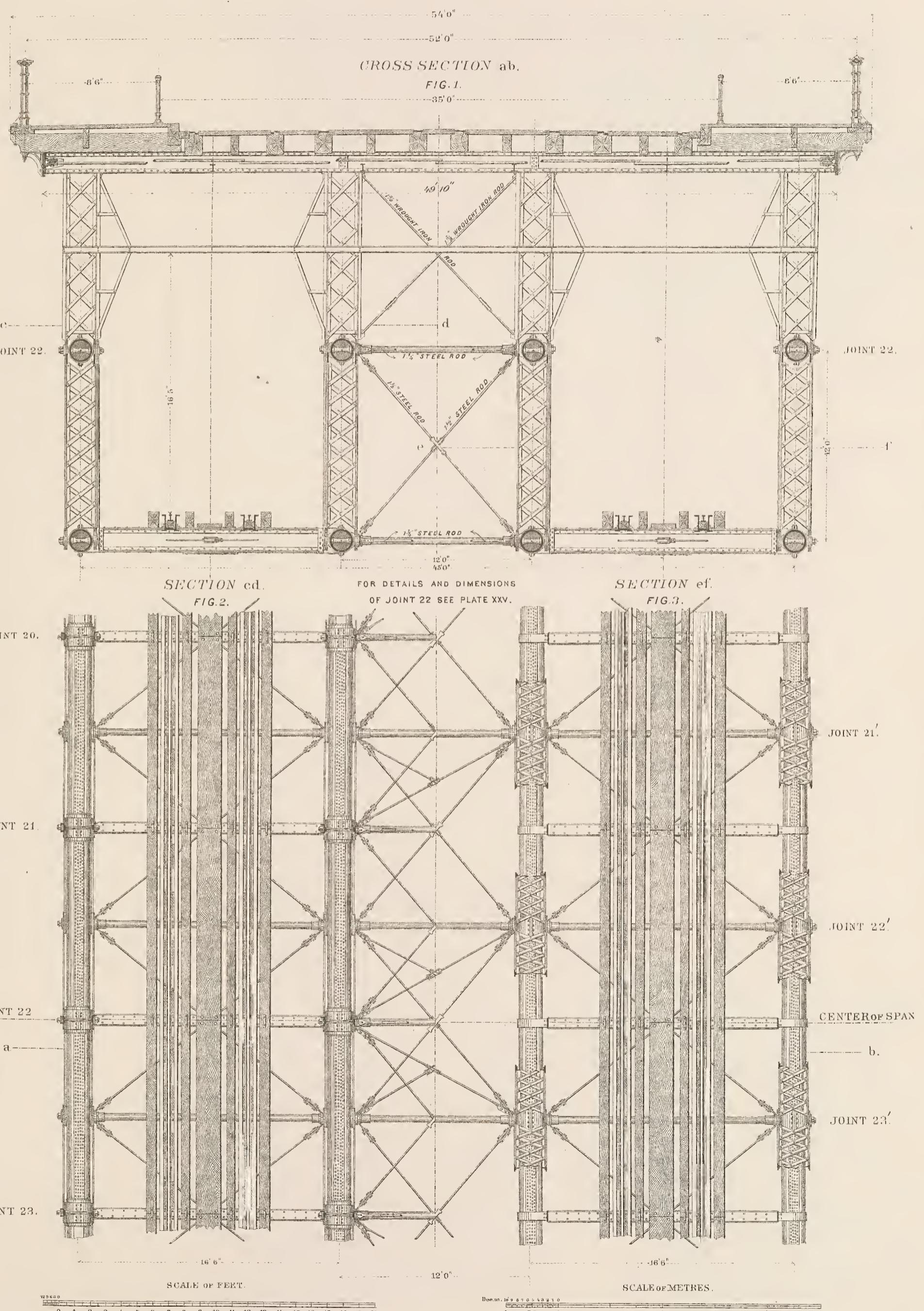
FIG. 2.

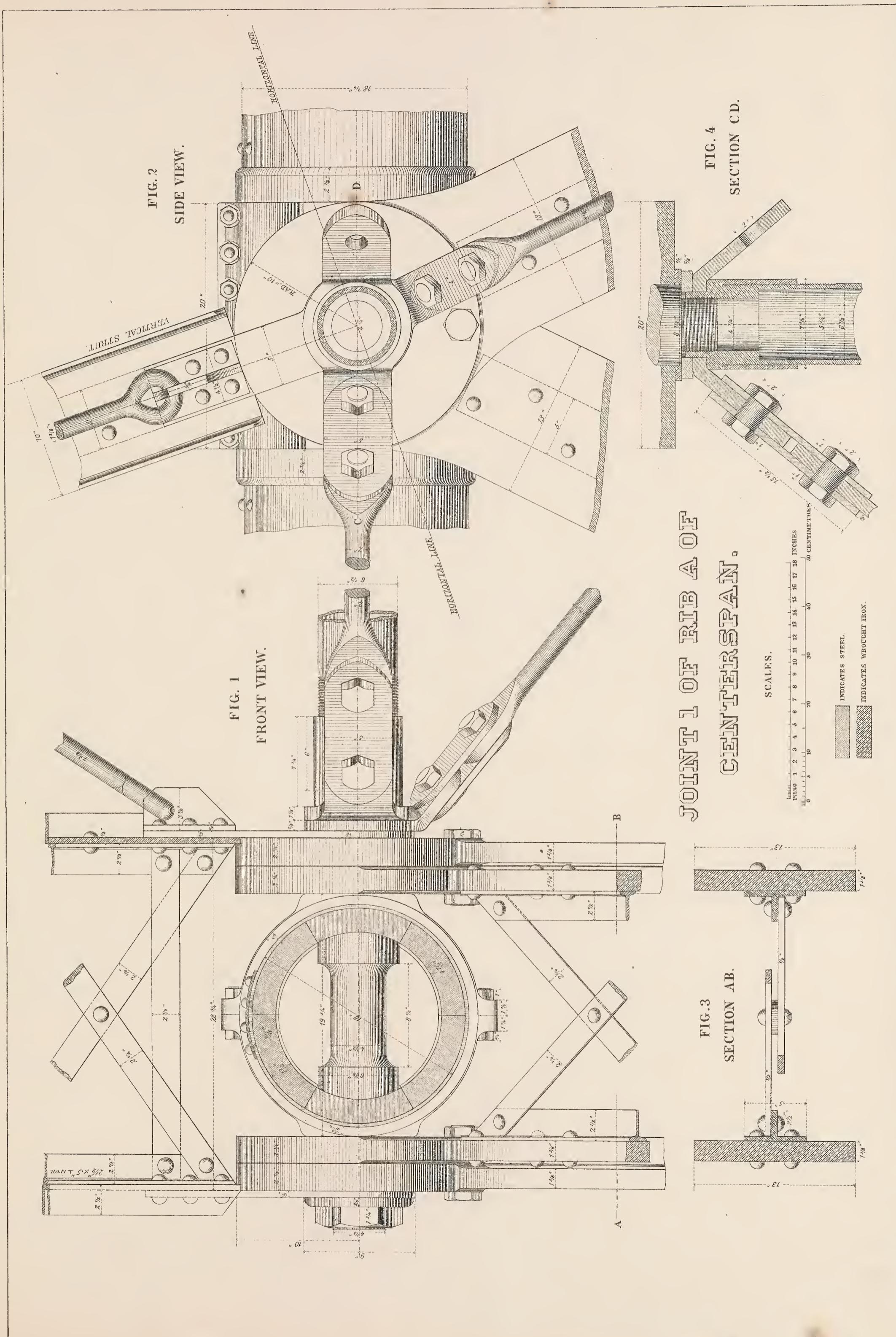


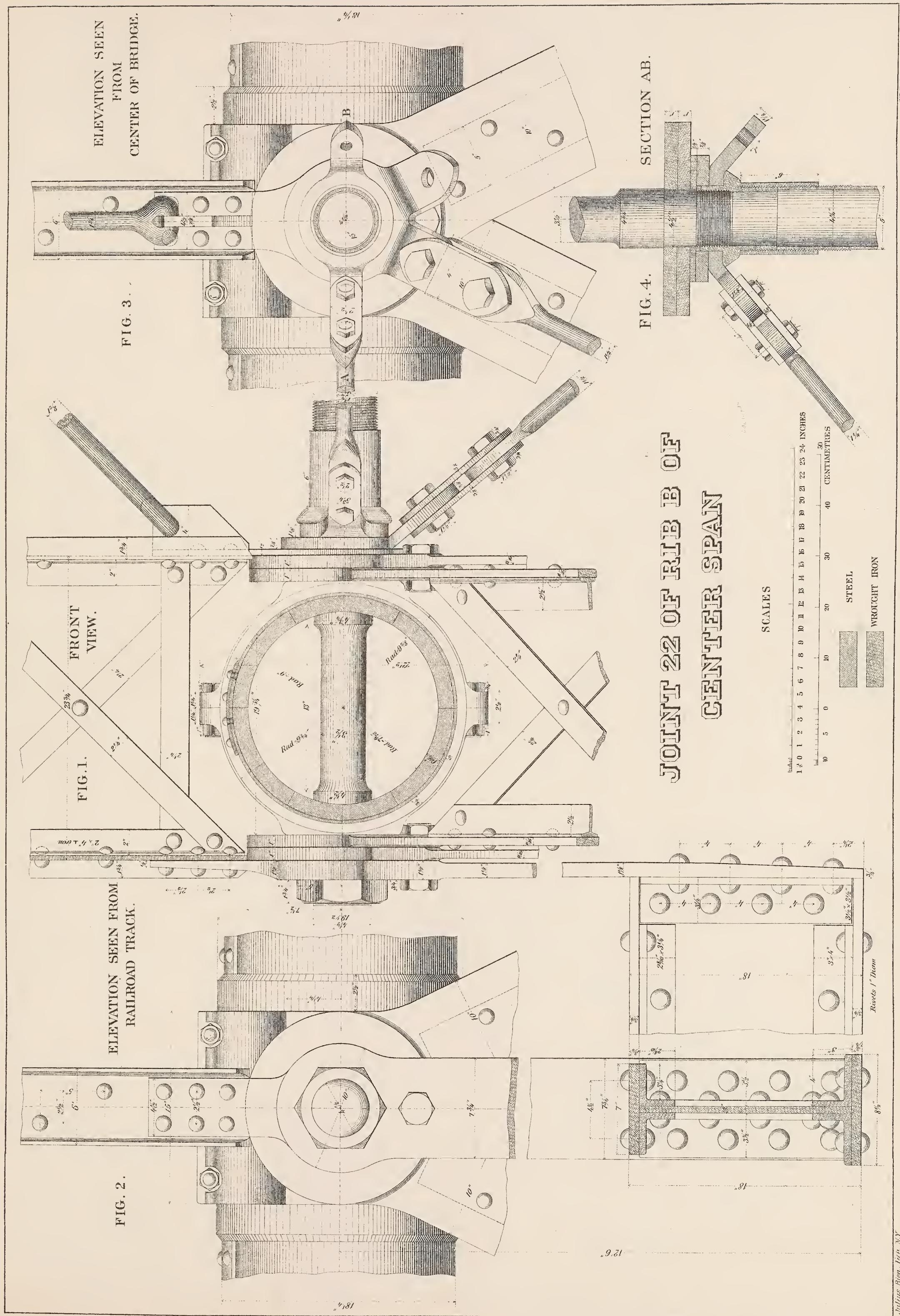
CROSS SECTION AT JOINT N°1
OF CENTER SPAN.

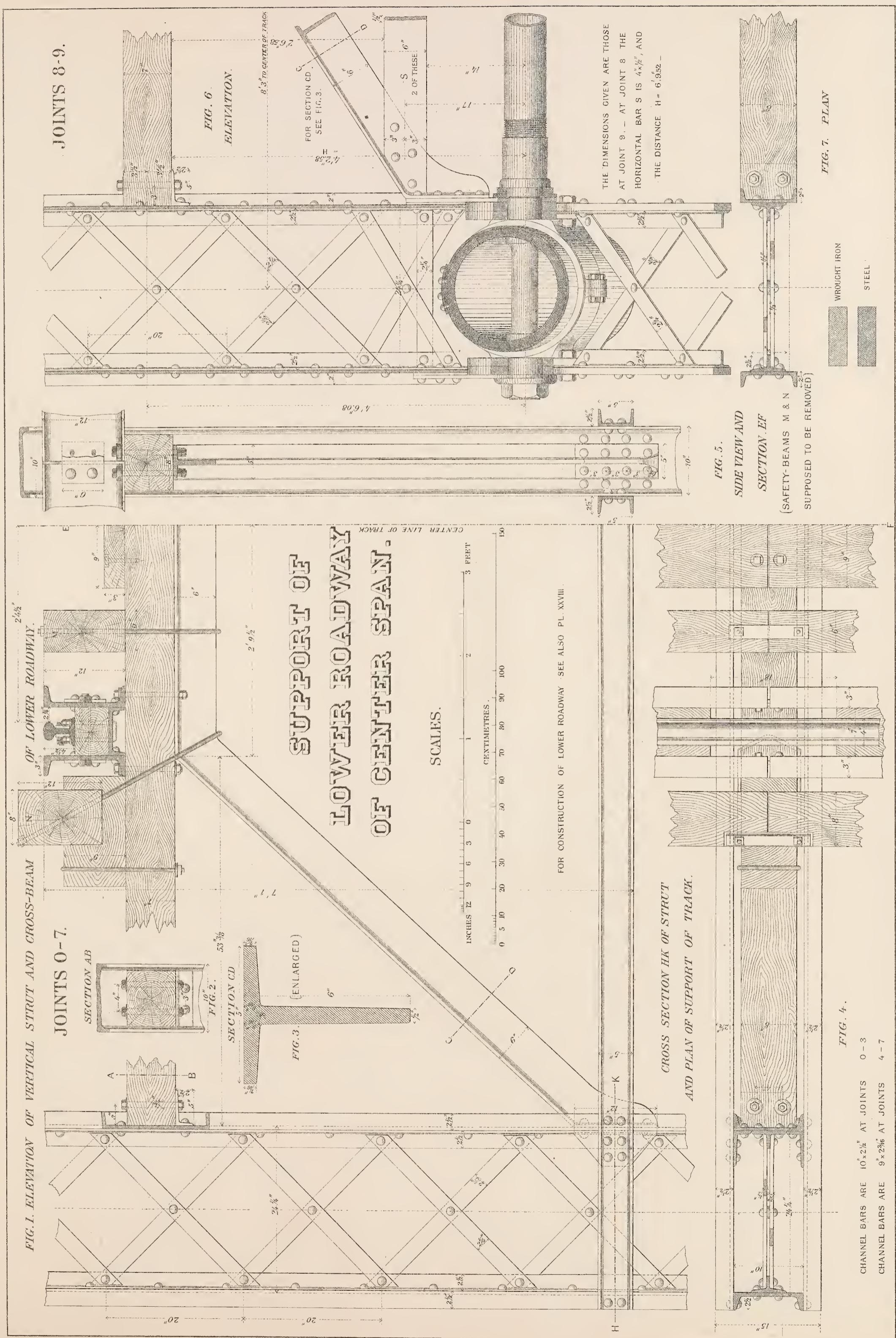


CROSS SECTION AND HORIZONTAL SECTIONS AT CENTER OF CENTER SPAN









SUPPORT OF LOWER ROADWAY OF CENTER SPAN.

FIG. 1. ELEVATION.

JOINT N°10.

FIG. 2. SECTION A.B.

JOINT N°11.

FIG. 5. SECTION E.F.

FIG. 4. ELEVATION.

FIG. 6. SECTION H.K.

FIG. 7. SECTION M.N.

FIG. 8. SECTION A.B.

FIG. 9. SECTION C.D.

FIG. 10. SECTION A.B.

FIG. 11. SECTION E.F.

FIG. 12. SECTION H.K.

FIG. 13. SECTION M.N.

FIG. 14. SECTION A.B.

FIG. 15. SECTION C.D.

FIG. 16. SECTION E.F.

FIG. 17. SECTION H.K.

FIG. 18. SECTION M.N.

FIG. 19. SECTION A.B.

FIG. 20. SECTION C.D.

FIG. 21. SECTION E.F.

FIG. 22. SECTION H.K.

FIG. 23. SECTION M.N.

FIG. 24. SECTION A.B.

FIG. 25. SECTION C.D.

FIG. 26. SECTION E.F.

FIG. 27. SECTION H.K.

FIG. 28. SECTION M.N.

FIG. 29. SECTION A.B.

FIG. 30. SECTION C.D.

FIG. 31. SECTION E.F.

FIG. 32. SECTION H.K.

FIG. 33. SECTION M.N.

FIG. 34. SECTION A.B.

FIG. 35. SECTION C.D.

FIG. 36. SECTION E.F.

FIG. 37. SECTION H.K.

FIG. 38. SECTION M.N.

FIG. 39. SECTION A.B.

FIG. 40. SECTION C.D.

FIG. 41. SECTION E.F.

FIG. 42. SECTION H.K.

FIG. 43. SECTION M.N.

FIG. 44. SECTION A.B.

FIG. 45. SECTION C.D.

FIG. 46. SECTION E.F.

FIG. 47. SECTION H.K.

FIG. 48. SECTION M.N.

FIG. 49. SECTION A.B.

FIG. 50. SECTION C.D.

FIG. 51. SECTION E.F.

FIG. 52. SECTION H.K.

FIG. 53. SECTION M.N.

FIG. 54. SECTION A.B.

FIG. 55. SECTION C.D.

FIG. 56. SECTION E.F.

FIG. 57. SECTION H.K.

FIG. 58. SECTION M.N.

FIG. 59. SECTION A.B.

FIG. 60. SECTION C.D.

FIG. 61. SECTION E.F.

FIG. 62. SECTION H.K.

FIG. 63. SECTION M.N.

FIG. 64. SECTION A.B.

FIG. 65. SECTION C.D.

FIG. 66. SECTION E.F.

FIG. 67. SECTION H.K.

FIG. 68. SECTION M.N.

FIG. 69. SECTION A.B.

FIG. 70. SECTION C.D.

FIG. 71. SECTION E.F.

FIG. 72. SECTION H.K.

FIG. 73. SECTION M.N.

FIG. 74. SECTION A.B.

FIG. 75. SECTION C.D.

FIG. 76. SECTION E.F.

FIG. 77. SECTION H.K.

FIG. 78. SECTION M.N.

FIG. 79. SECTION A.B.

FIG. 80. SECTION C.D.

FIG. 81. SECTION E.F.

FIG. 82. SECTION H.K.

FIG. 83. SECTION M.N.

FIG. 84. SECTION A.B.

FIG. 85. SECTION C.D.

FIG. 86. SECTION E.F.

FIG. 87. SECTION H.K.

FIG. 88. SECTION M.N.

FIG. 89. SECTION A.B.

FIG. 90. SECTION C.D.

FIG. 91. SECTION E.F.

FIG. 92. SECTION H.K.

FIG. 93. SECTION M.N.

FIG. 94. SECTION A.B.

FIG. 95. SECTION C.D.

FIG. 96. SECTION E.F.

FIG. 97. SECTION H.K.

FIG. 98. SECTION M.N.

FIG. 99. SECTION A.B.

FIG. 100. SECTION C.D.

FIG. 101. SECTION E.F.

FIG. 102. SECTION H.K.

FIG. 103. SECTION M.N.

FIG. 104. SECTION A.B.

FIG. 105. SECTION C.D.

FIG. 106. SECTION E.F.

FIG. 107. SECTION H.K.

FIG. 108. SECTION M.N.

FIG. 109. SECTION A.B.

FIG. 110. SECTION C.D.

FIG. 111. SECTION E.F.

FIG. 112. SECTION H.K.

FIG. 113. SECTION M.N.

FIG. 114. SECTION A.B.

FIG. 115. SECTION C.D.

FIG. 116. SECTION E.F.

FIG. 117. SECTION H.K.

FIG. 118. SECTION M.N.

FIG. 119. SECTION A.B.

FIG. 120. SECTION C.D.

FIG. 121. SECTION E.F.

FIG. 122. SECTION H.K.

FIG. 123. SECTION M.N.

FIG. 124. SECTION A.B.

FIG. 125. SECTION C.D.

FIG. 126. SECTION E.F.

FIG. 127. SECTION H.K.

FIG. 128. SECTION M.N.

FIG. 129. SECTION A.B.

FIG. 130. SECTION C.D.

FIG. 131. SECTION E.F.

FIG. 132. SECTION H.K.

FIG. 133. SECTION M.N.

FIG. 134. SECTION A.B.

FIG. 135. SECTION C.D.

FIG. 136. SECTION E.F.

FIG. 137. SECTION H.K.

FIG. 138. SECTION M.N.

FIG. 139. SECTION A.B.

FIG. 140. SECTION C.D.

FIG. 141. SECTION E.F.

FIG. 142. SECTION H.K.

FIG. 143. SECTION M.N.

FIG. 144. SECTION A.B.

FIG. 145. SECTION C.D.

FIG. 146. SECTION E.F.

FIG. 147. SECTION H.K.

FIG. 148. SECTION M.N.

FIG. 149. SECTION A.B.

FIG. 150. SECTION C.D.

FIG. 151. SECTION E.F.

FIG. 152. SECTION H.K.

FIG. 153. SECTION M.N.

FIG. 154. SECTION A.B.

FIG. 155. SECTION C.D.

FIG. 156. SECTION E.F.

FIG. 157. SECTION H.K.

FIG. 158. SECTION M.N.

FIG. 159. SECTION A.B.

FIG. 160. SECTION C.D.

FIG. 161. SECTION E.F.

FIG. 162. SECTION H.K.

FIG. 163. SECTION M.N.

FIG. 164. SECTION A.B.

FIG. 165. SECTION C.D.

FIG. 166. SECTION E.F.

FIG. 167. SECTION H.K.

FIG. 168. SECTION M.N.

FIG. 169. SECTION A.B.

FIG. 170. SECTION C.D.

FIG. 171. SECTION E.F.

FIG. 172. SECTION H.K.

FIG. 173. SECTION M.N.

FIG. 174. SECTION A.B.

FIG. 175. SECTION C.D.

FIG. 176. SECTION E.F.

FIG. 177. SECTION H.K.

FIG. 178. SECTION M.N.

FIG. 179. SECTION A.B.

FIG. 180. SECTION C.D.

FIG. 181. SECTION E.F.

FIG. 182. SECTION H.K.

FIG. 183. SECTION M.N.

FIG. 184. SECTION A.B.

FIG. 185. SECTION C.D.

FIG. 186. SECTION E.F.

FIG. 187. SECTION H.K.

FIG. 188. SECTION M.N.

FIG. 189. SECTION A.B.

FIG. 190. SECTION C.D.

FIG. 191. SECTION E.F.

FIG. 192. SECTION H.K.

FIG. 193. SECTION M.N.

FIG. 194. SECTION A.B.

FIG. 195. SECTION C.D.

FIG. 196. SECTION E.F.

FIG. 197. SECTION H.K.

FIG. 198. SECTION M.N.

FIG. 199. SECTION A.B.

FIG. 200

SUPPORT OF LOWER ROADWAY OF CENTER SPAN.

JOINT 13.

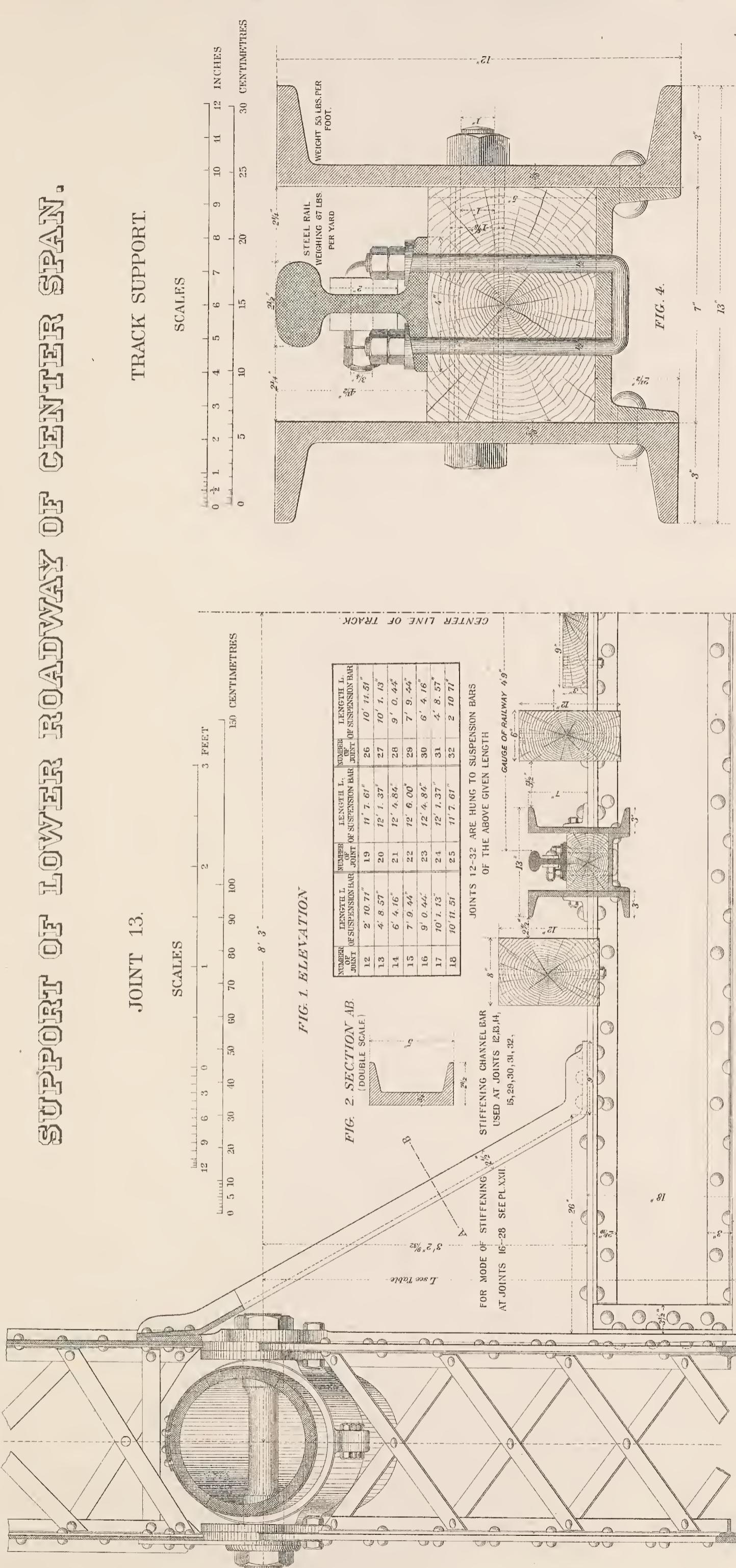


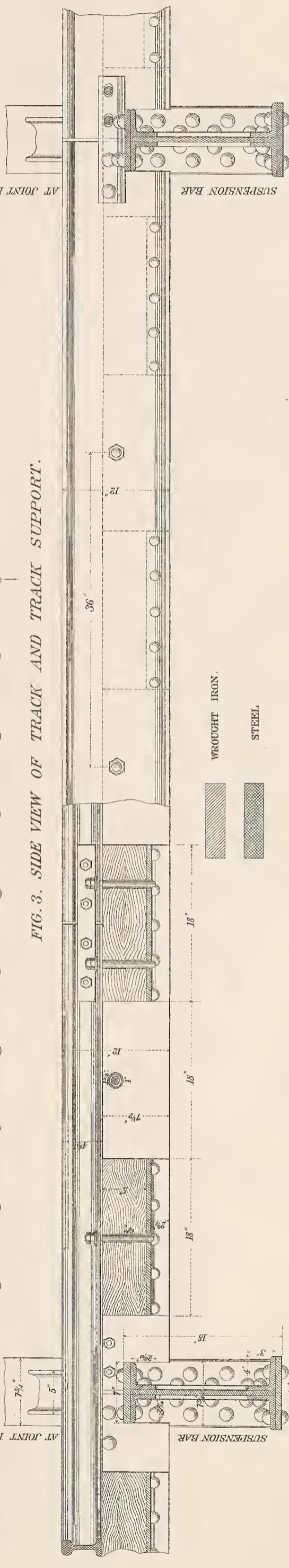
FIG. 1. ELEVATION

FIG. 2. SECTION AB. (DOUBLE SCALE)					
NUMBER OF JOINTS	LENGTH L. OF SUSPENSION BAR	NUMBER OF JOINTS	LENGTH L. OF SUSPENSION BAR	NUMBER OF JOINTS	LENGTH L. OF SUSPENSION BAR
12	2' 10.71"	19	11' 7.61"	26	10' 11.51"
13	4' 8.57"	20	12' 1.37"	27	10' 1.13"
14	6' 4.16"	21	12' 4.84"	28	9' 0.44"
15	7' 9.44"	22	12' 6.00"	29	7' 9.44"
16	9' 0.44"	23	12' 4.84"	30	6' 4.16"
17	10' 1.13"	24	12' 1.37"	31	4' 8.57"
18	10' 11.51"	25	11' 7.61"	32	2' 10.71"

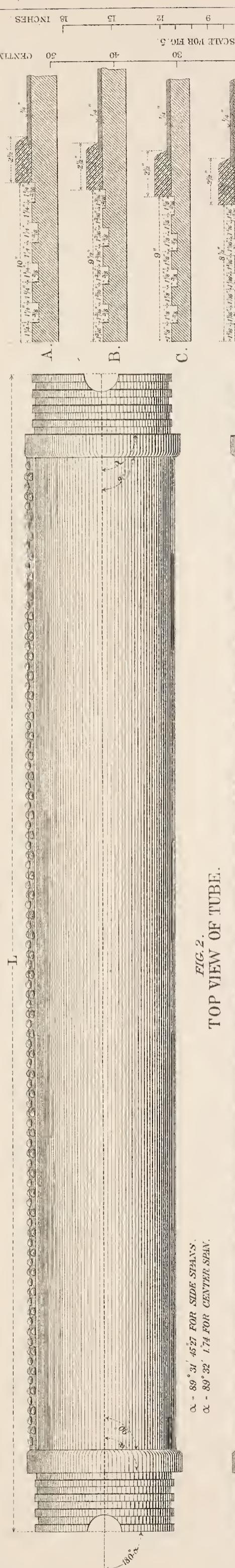
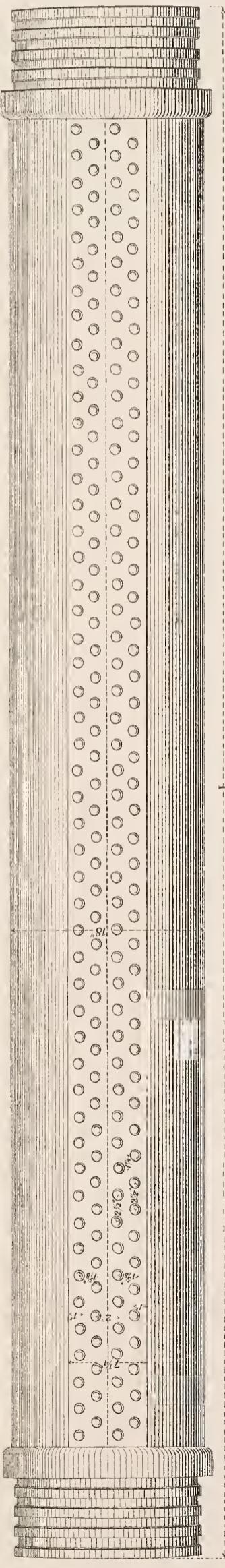
JOINTS 12-32 ARE HUNG TO SUSPENSION BARS

FIG. 4.

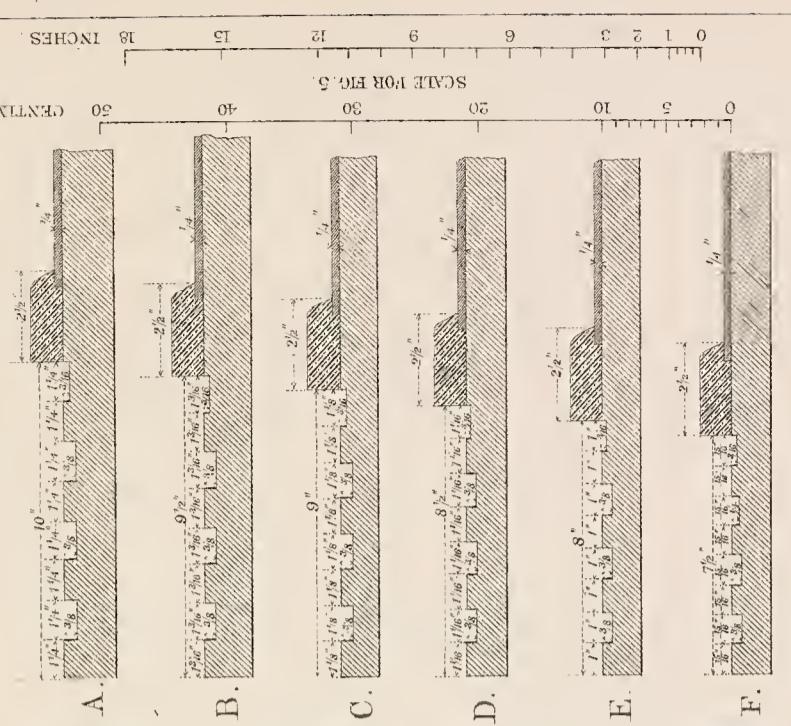
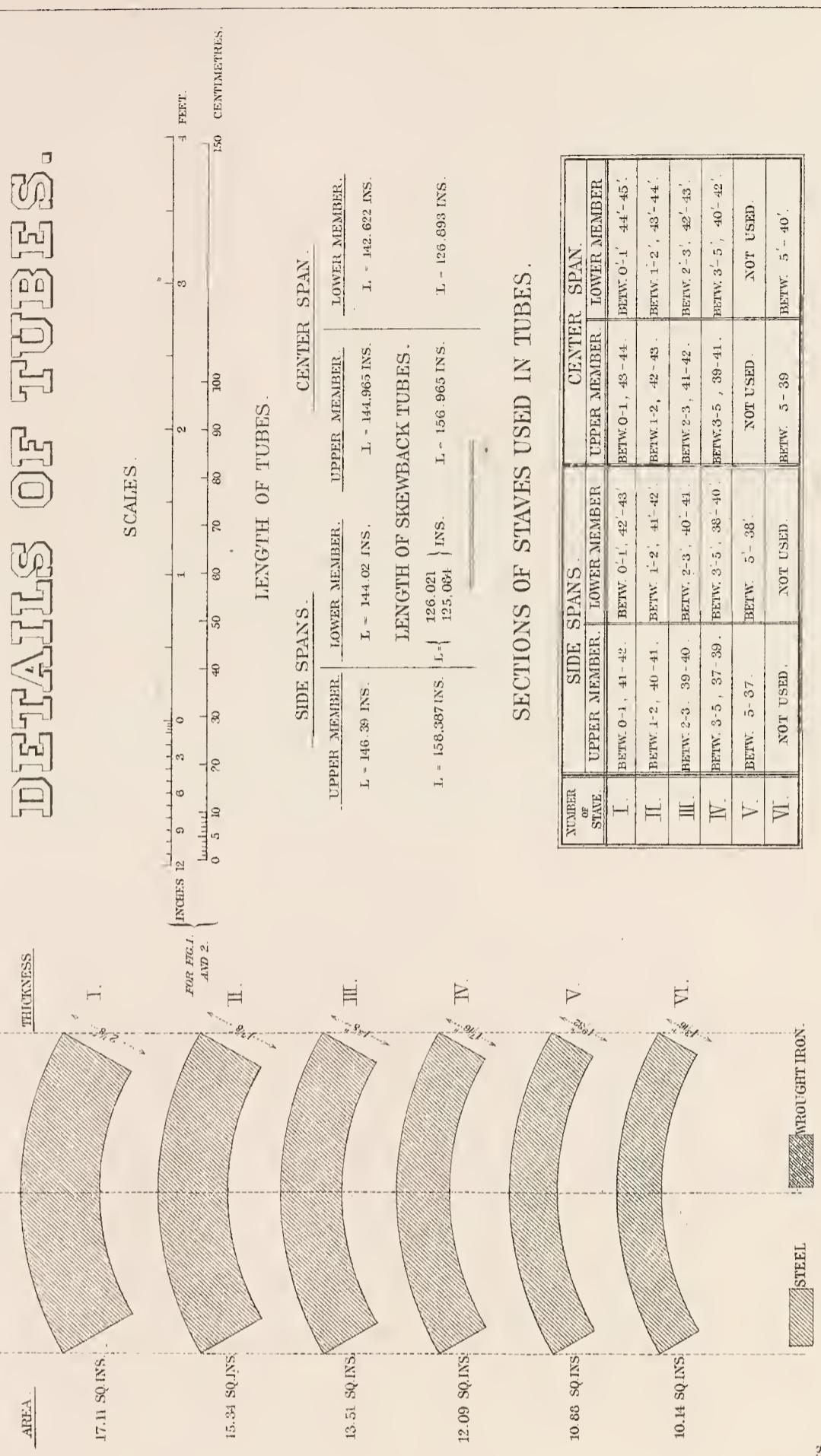
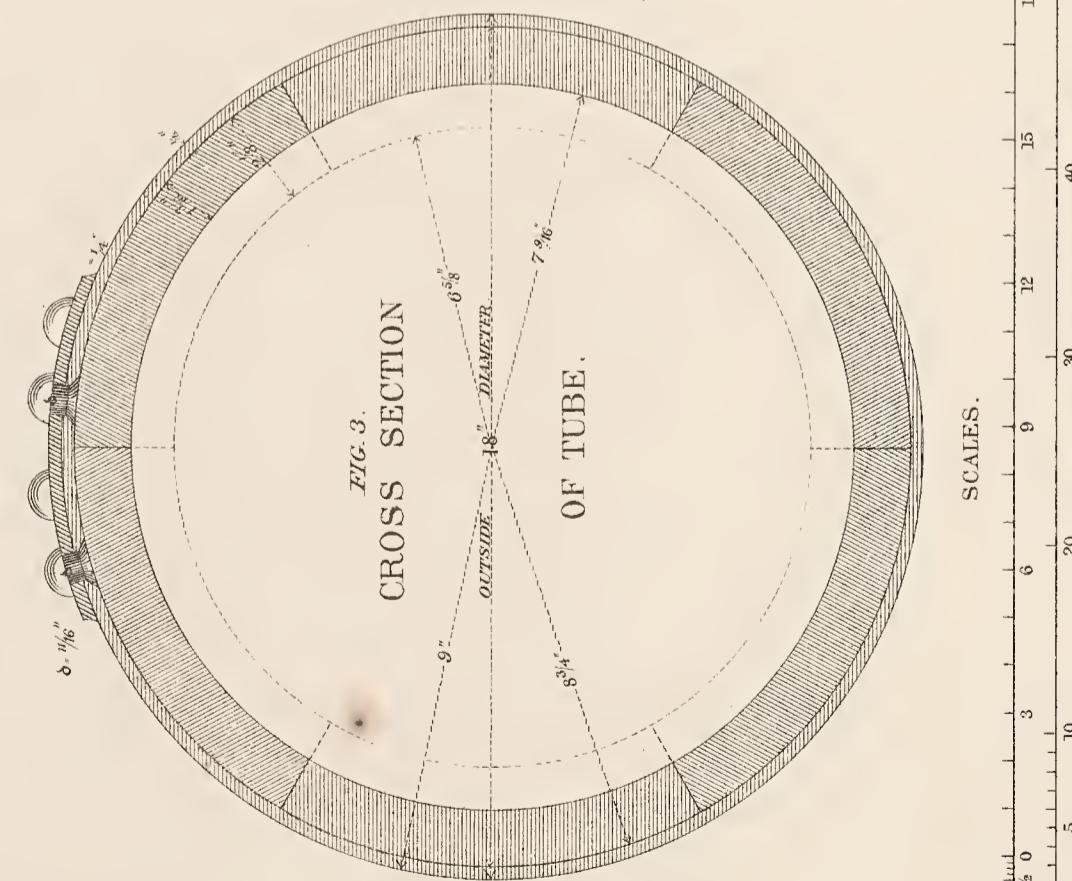
Fig. 3. SIDE VIEW OF TRACK AND IRACK SUFFOLI.



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FIG. 1.
ELEVATION OF TUBE.FIG. 2.
TOP VIEW OF TUBE.

$\alpha = 89^{\circ} 31' 45\frac{1}{2}''$ FOR SIDE SPANS.
 $\alpha = 89^{\circ} 32' 17\frac{1}{4}''$ FOR CENTER SPAN.

FIG. 3.
DETAILS OF GROOVES.FIG. 4.
DETAILS OF TUBES.FIG. 3.
CROSS SECTION
OF TUBE.

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FOR FIG. 3-4.

NUMBER of STAVE	SIDE SPANS.		CENTER SPAN.	
	UPPER MEMBER.	LOWER MEMBER.	UPPER MEMBER.	LOWER MEMBER.
I.	BETW. 0-1.	41'-42'	BETW. 0'-1.	44'-45'
II.	BETW. 1-2.	40'-41'	BETW. 1'-2.	41'-42'
III.	BETW. 2-3.	39'-40'	BETW. 2'-3.	40'-41'
IV.	BETW. 3-5.	37'-39'	BETW. 3'-5.	38'-40'
V.	BETW. 5-37.	NOT USED.	BETW. 5'-38'.	NOT USED.
VI.	NOT USED.	NOT USED.	BETW. 5'-39	BETW. 5'-40'

STEEL
WROUGHT IRON.

FIG. 5.
DETAILS OF STAVES.

DETAILS OF COUPLING.

SIDE VIEW OF COUPLING.

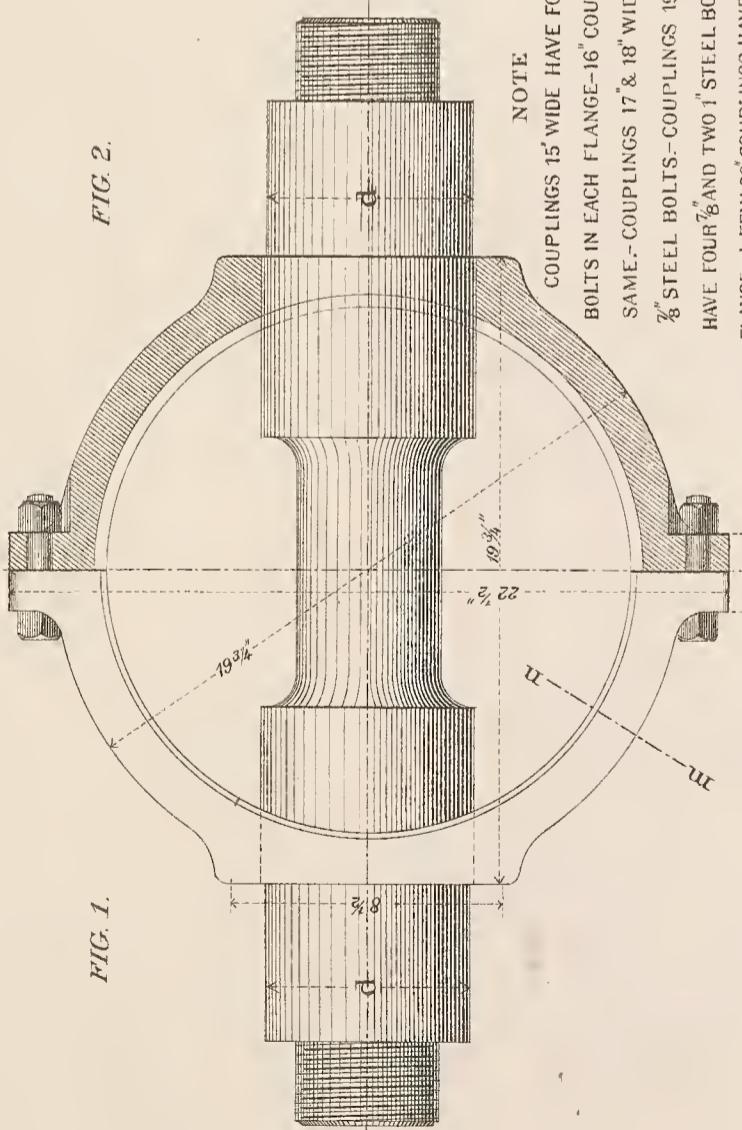
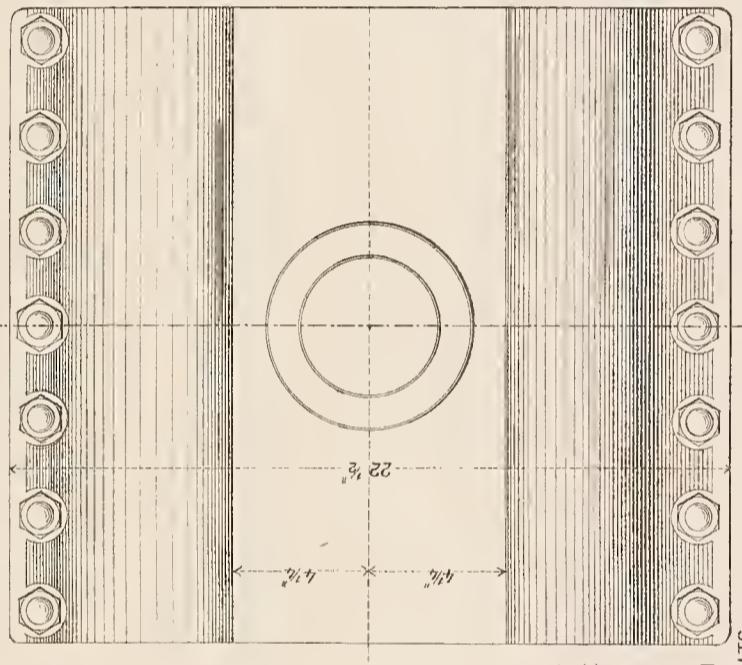


FIG. 2.

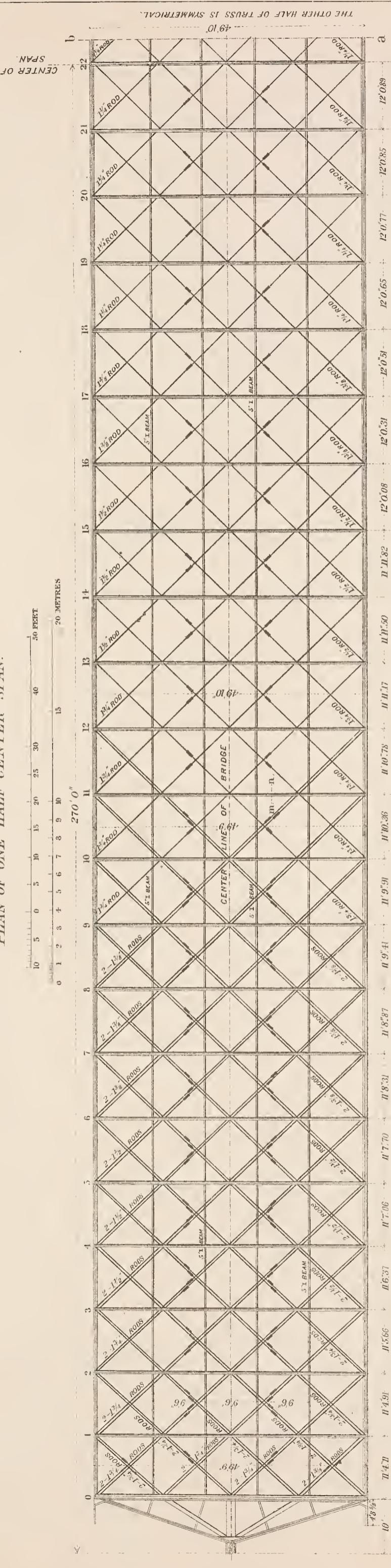


SCALES.

FIG. L, 2, 3 & 5.	SCALES.											
	10	5	0	10	20	30	40	50	40	30	20	10
FOR	1 $\frac{3}{4}$	0	1	2	3	4	5	6	7	8	9	10
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	11	12	13	14	15	16	17	18	19	20	21	22
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	23	24	25	26	27	28	29	30	31	32	33	34
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	35	36	37	38	39	40	41	42	43	44	45	46
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	47	48	49	50	51	52	53	54	55	56	57	58
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	59	60	61	62	63	64	65	66	67	68	69	70
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	71	72	73	74	75	76	77	78	79	80	81	82
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	83	84	85	86	87	88	89	90	91	92	93	94
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	95	96	97	98	99	100	101	102	103	104	105	106
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	107	108	109	110	111	112	113	114	115	116	117	118
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	119	120	121	122	123	124	125	126	127	128	129	130
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	131	132	133	134	135	136	137	138	139	140	141	142
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	143	144	145	146	147	148	149	150	151	152	153	154
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	155	156	157	158	159	160	161	162	163	164	165	166
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	167	168	169	170	171	172	173	174	175	176	177	178
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	179	180	181	182	183	184	185	186	187	188	189	190
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	191	192	193	194	195	196	197	198	199	200	201	202
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	203	204	205	206	207	208	209	210	211	212	213	214
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	215	216	217	218	219	220	221	222	223	224	225	226
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	227	228	229	230	231	232	233	234	235	236	237	238
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	239	240	241	242	243	244	245	246	247	248	249	250
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	251	252	253	254	255	256	257	258	259	260	261	262
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	263	264	265	266	267	268	269	270	271	272	273	274
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	275	276	277	278	279	280	281	282	283	284	285	286
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	287	288	289	290	291	292	293	294	295	296	297	298
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	299	300	301	302	303	304	305	306	307	308	309	310
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	311	312	313	314	315	316	317	318	319	320	321	322
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	323	324	325	326	327	328	329	330	331	332	333	334
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	335	336	337	338	339	340	341	342	343	344	345	346
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	347	348	349	350	351	352	353	354	355	356	357	358
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	359	360	361	362	363	364	365	366	367	368	369	370
FIG. L, 2, 3 & 5.	10	5	0	10	20	30	40	50	40	30	20	10
FOR	371	372	373	374	375	376	377	378	379	380	381	382
FIG. L												

UPPER WIND-TERRACES.

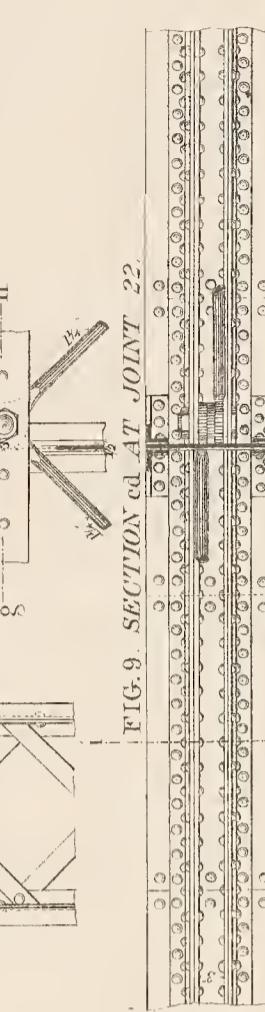
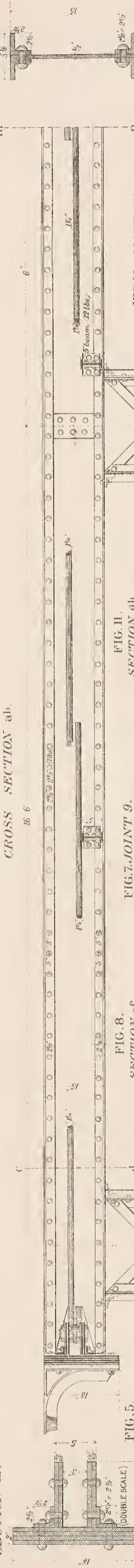
PLAN OF ONE-HALF CENTER SPAN.



HORIZONTAL SECTION OF VERTICAL PLATES IN CHORD OF TRUSS.



FIG. 13.



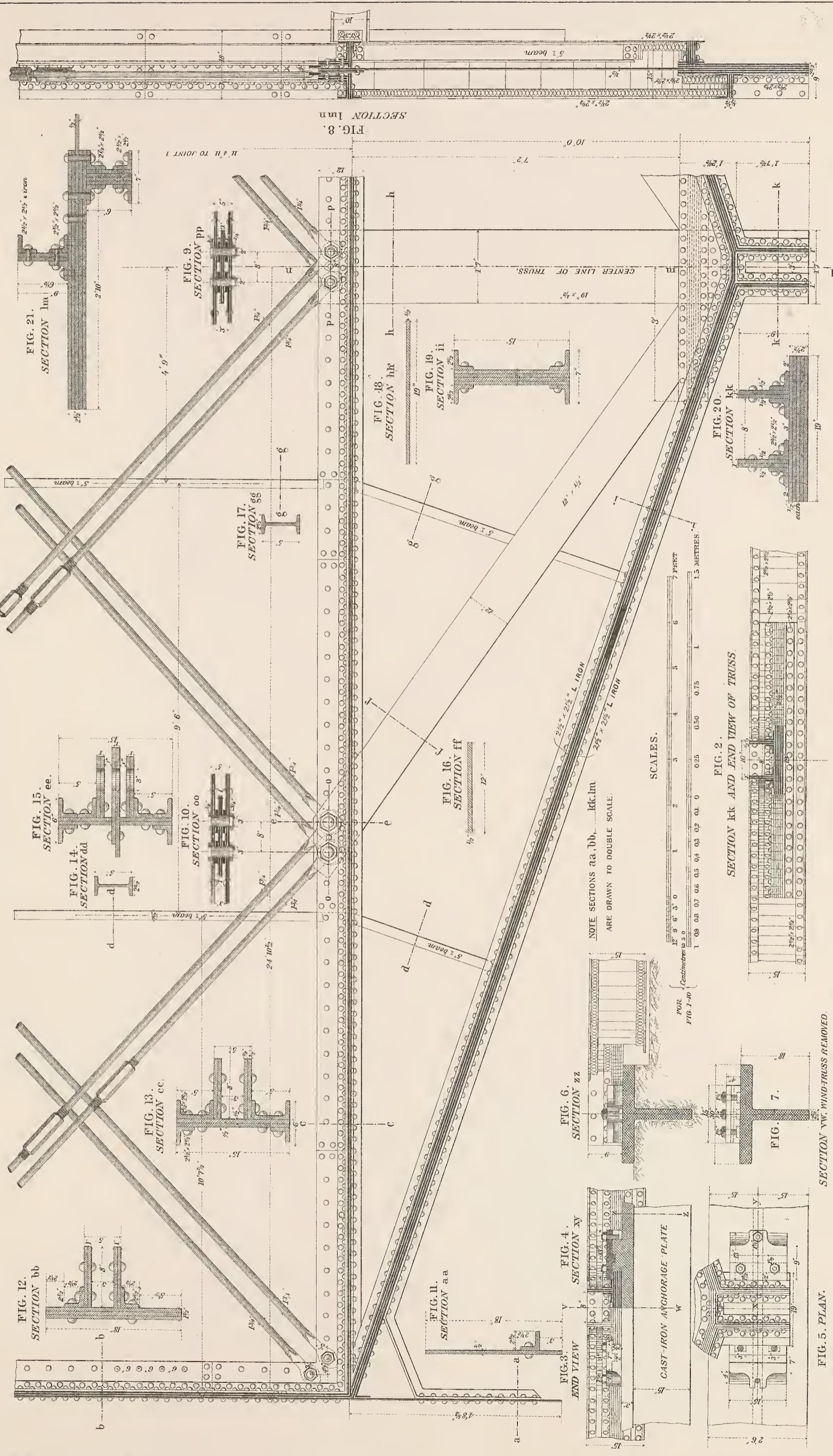
SCALE OF FEET.		SCALE OF METRES.	
0	0	0	0
1	3	0.305	0.305
2	6	0.610	0.610
3	9	0.915	0.915
4	12	1.220	1.220
5	15	1.525	1.525
6	18	1.830	1.830
7	21	2.135	2.135
8	24	2.440	2.440
9	27	2.745	2.745
10	30	3.050	3.050
11	33	3.355	3.355
12	36	3.660	3.660
13	39	3.965	3.965
14	42	4.270	4.270
15	45	4.575	4.575
16	48	4.880	4.880
17	51	5.185	5.185
18	54	5.490	5.490
19	57	5.795	5.795
20	60	6.100	6.100
21	63	6.405	6.405
22	66	6.710	6.710
23	69	7.015	7.015
24	72	7.320	7.320
25	75	7.625	7.625
26	78	7.930	7.930
27	81	8.235	8.235
28	84	8.540	8.540
29	87	8.845	8.845
30	90	9.150	9.150



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WIND-TERURE

FIG. 1.
HORIZONTAL SECTION OF END OF TRUSS.



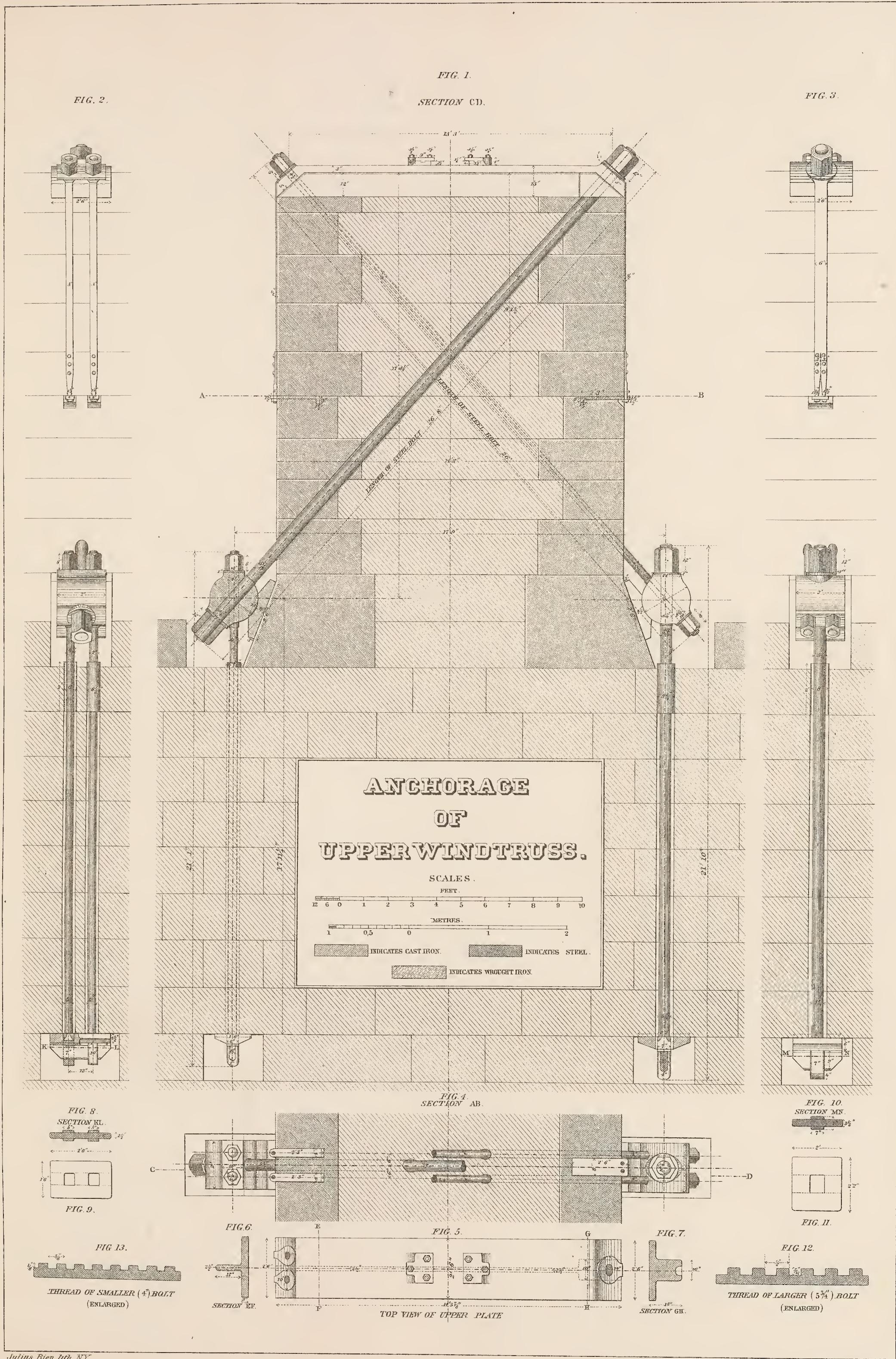


FIG. 1. ELEVATION OF TESTING MACHINE.

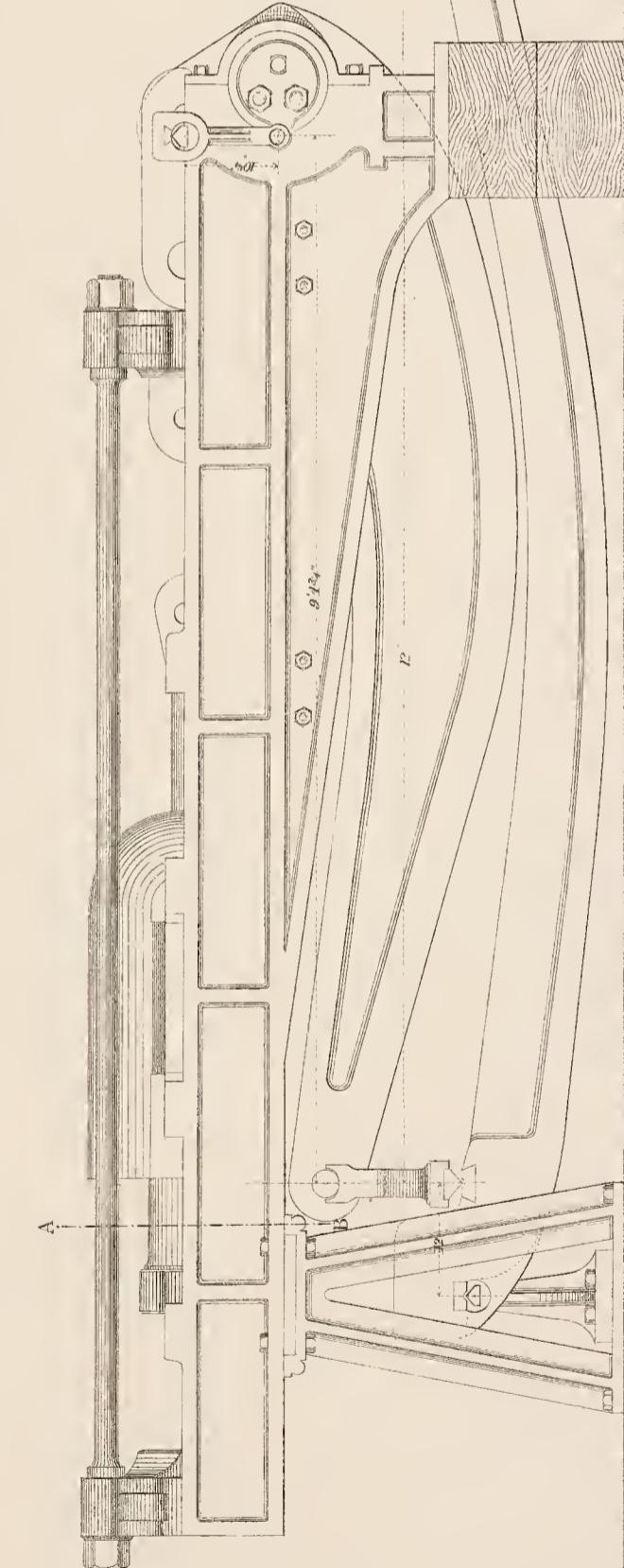


FIG. 2. LONGITUDINAL SECTION CD.

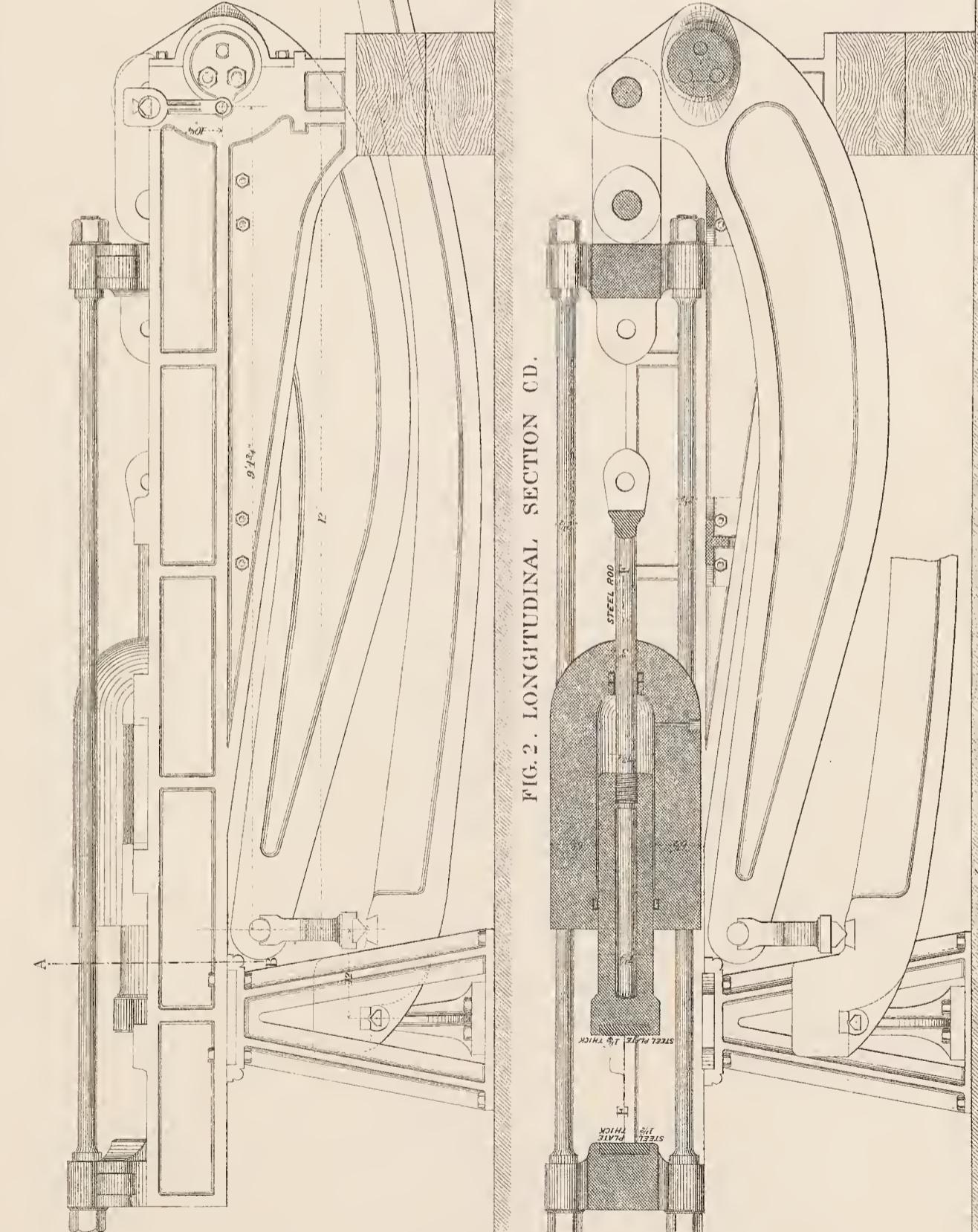


FIG. 3. HORIZONTAL SECTION EF.

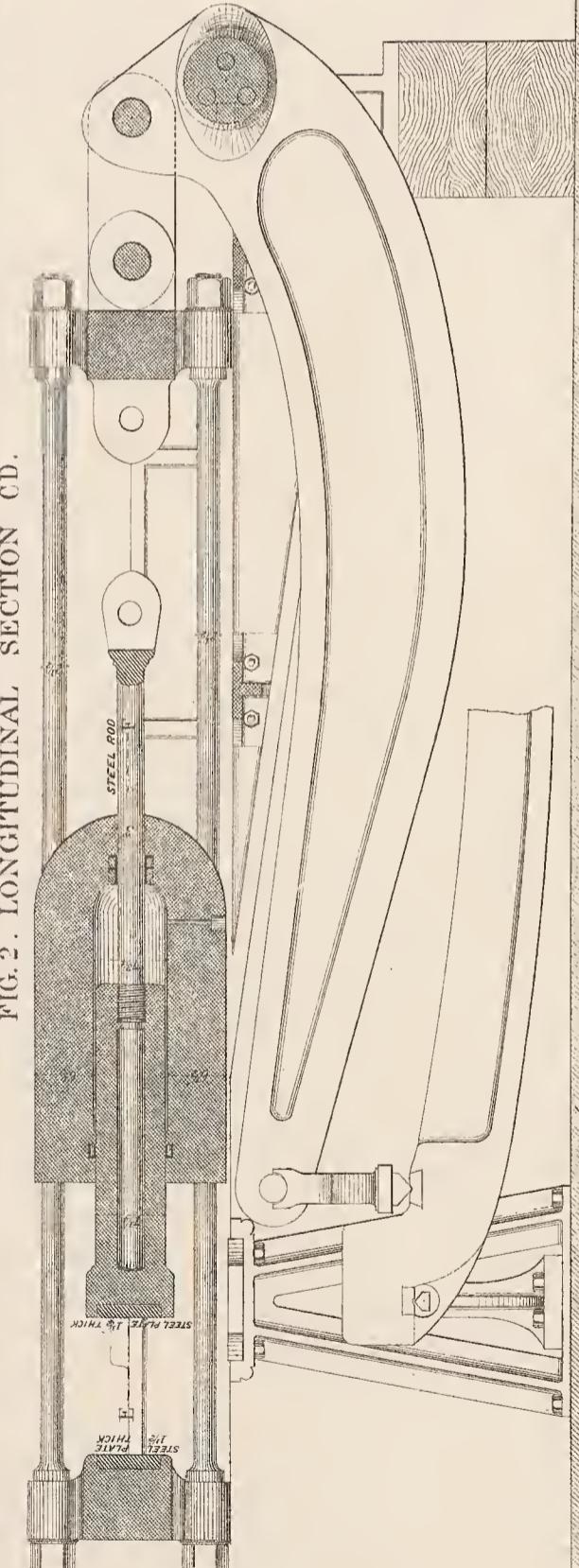
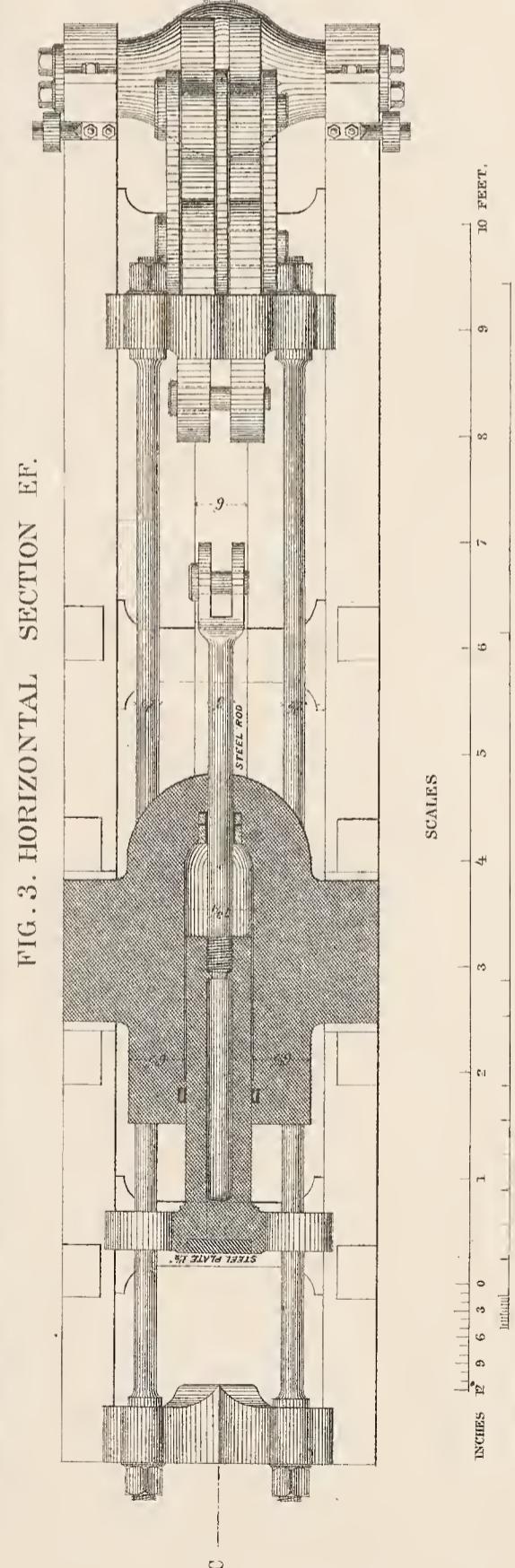


FIG. 4. CROSS SECTION AB

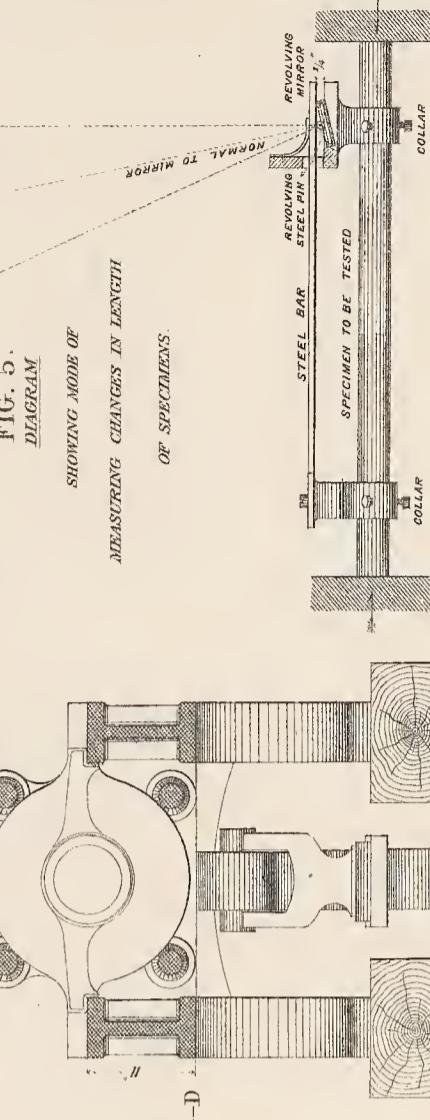


SCALES
INCHES 10 9 8 7 6 5 4 3 2 1
CENTIMETRES 100 90 80 70 60 50 40 30 20 10 FEET.
2 METRES.

ST. LOUIS TESTING MACHINE.

CAPACITY = 100 TONS.

COMBINED LEVERAGE = 1999.2, i.e. WEIGHT
OF 1 LB. AVERAGED IN SCALE PAN EXERTED
A FORCE OF 1999.2, SAY 2000 LBS.-TON ON LEVERS.

FIG. 5.
DIAGRAM
SHOWING MODE OF
MEASURING CHANGES IN LENGTH
OF SPECIMENS.

METHOD OF ERECTION.

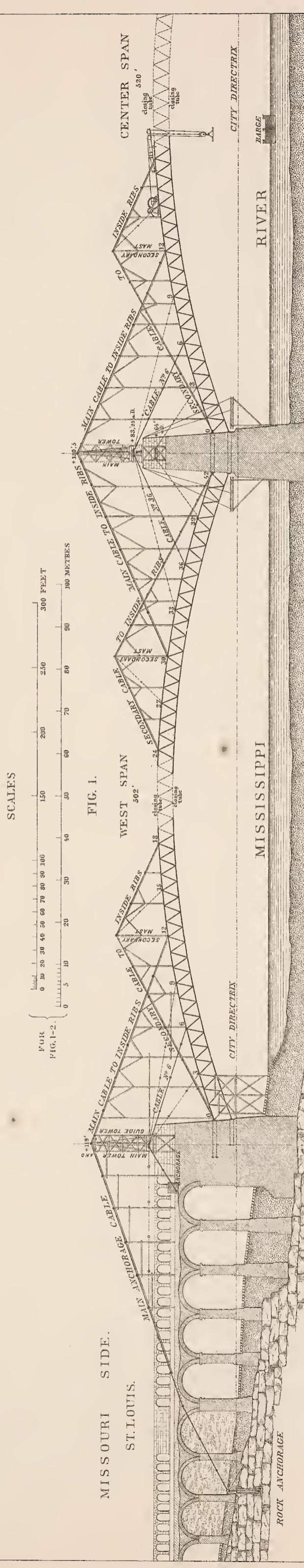


FIG. 1.

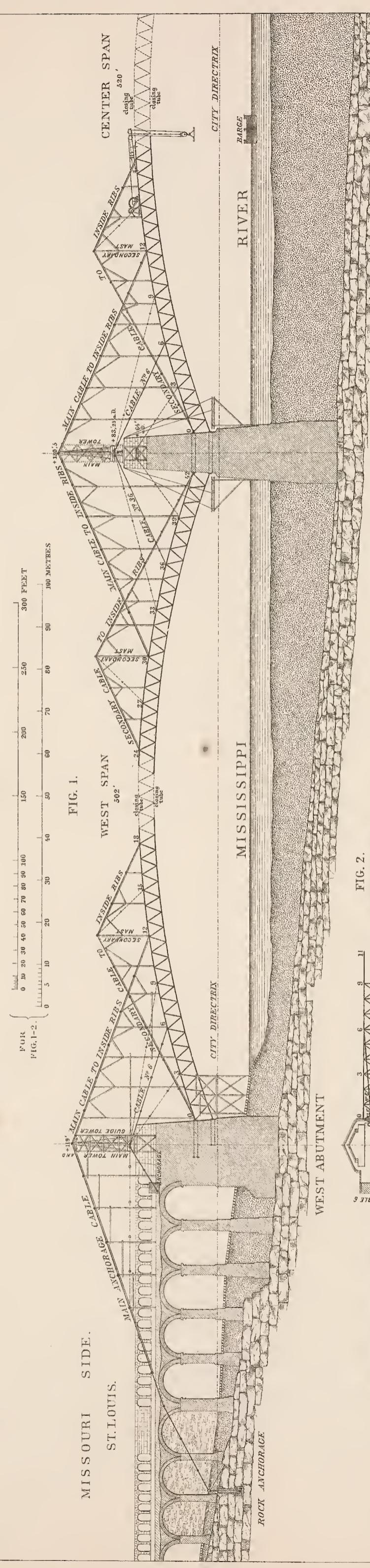


FIG. 2.



FIG. 3.

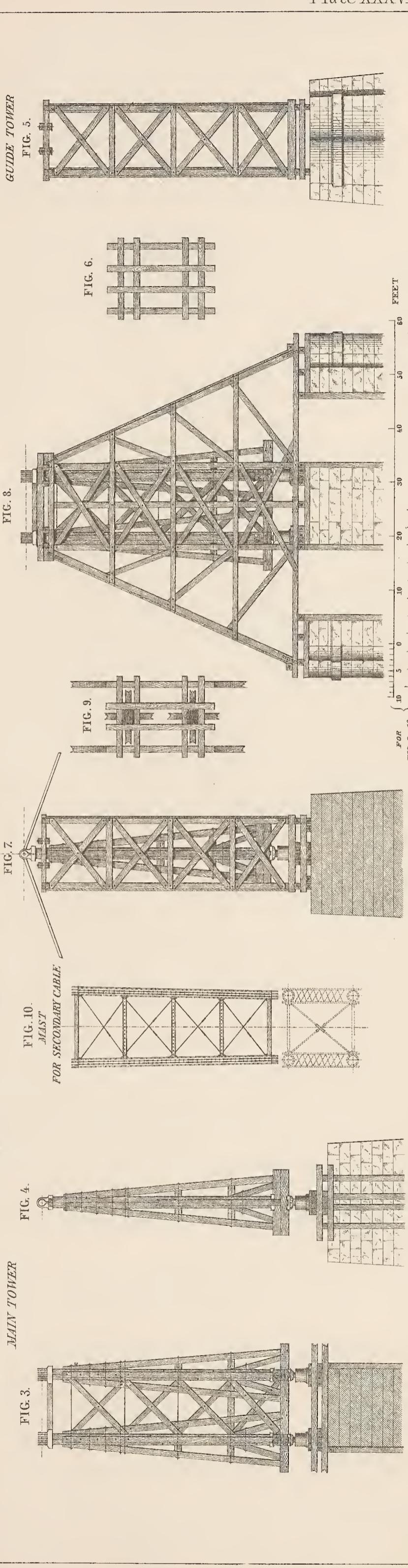


FIG. 4.

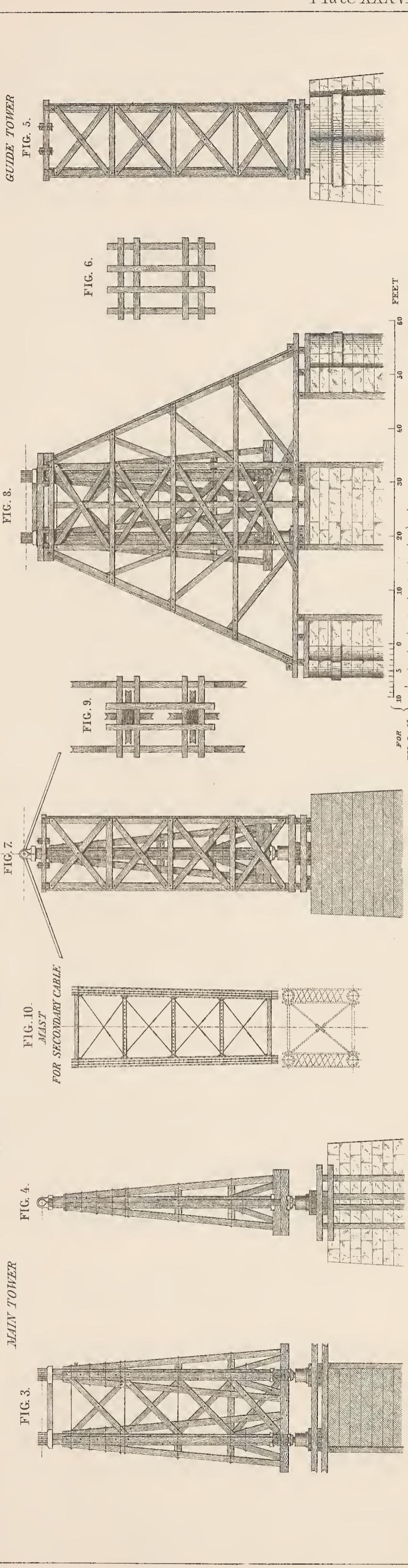


FIG. 5.

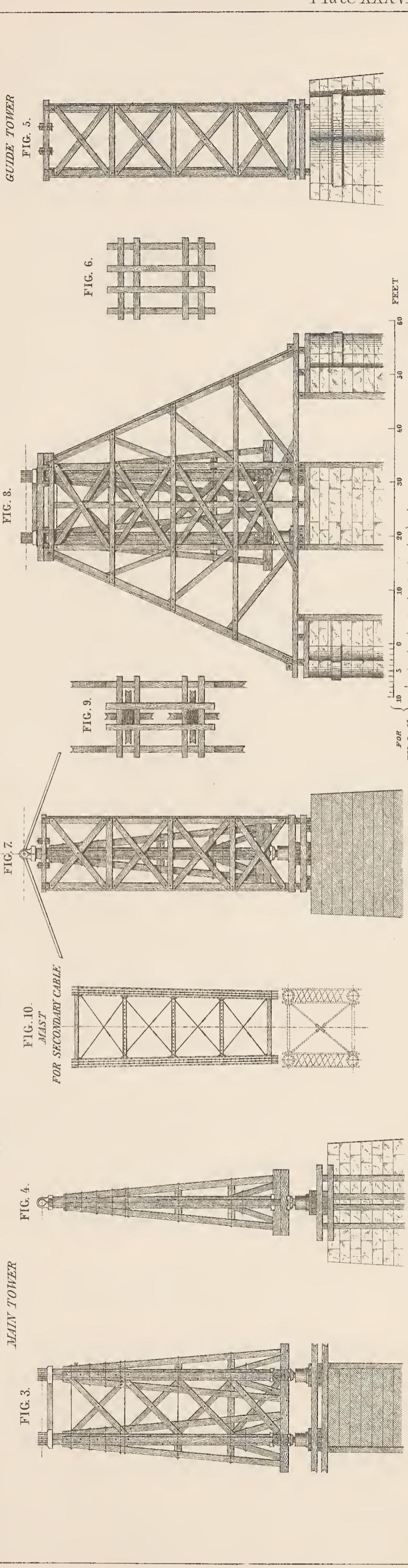


FIG. 6.

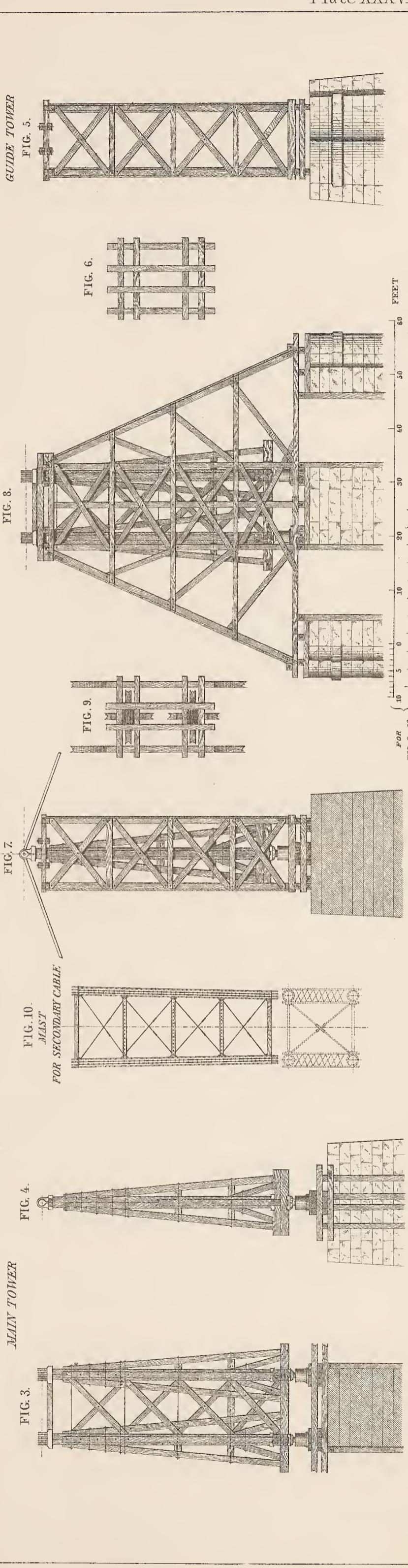


FIG. 7.

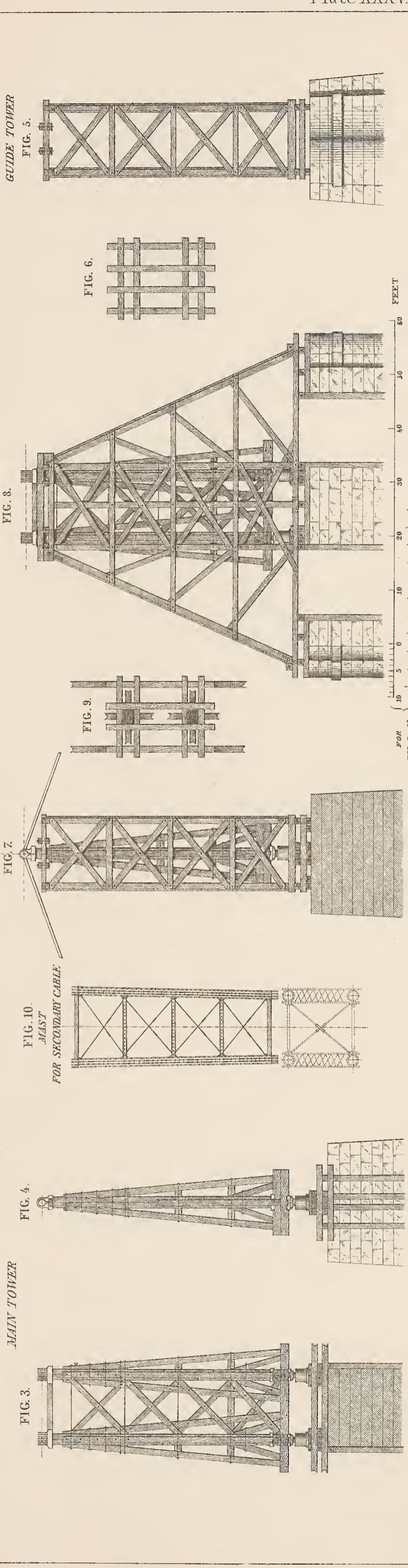


FIG. 8.

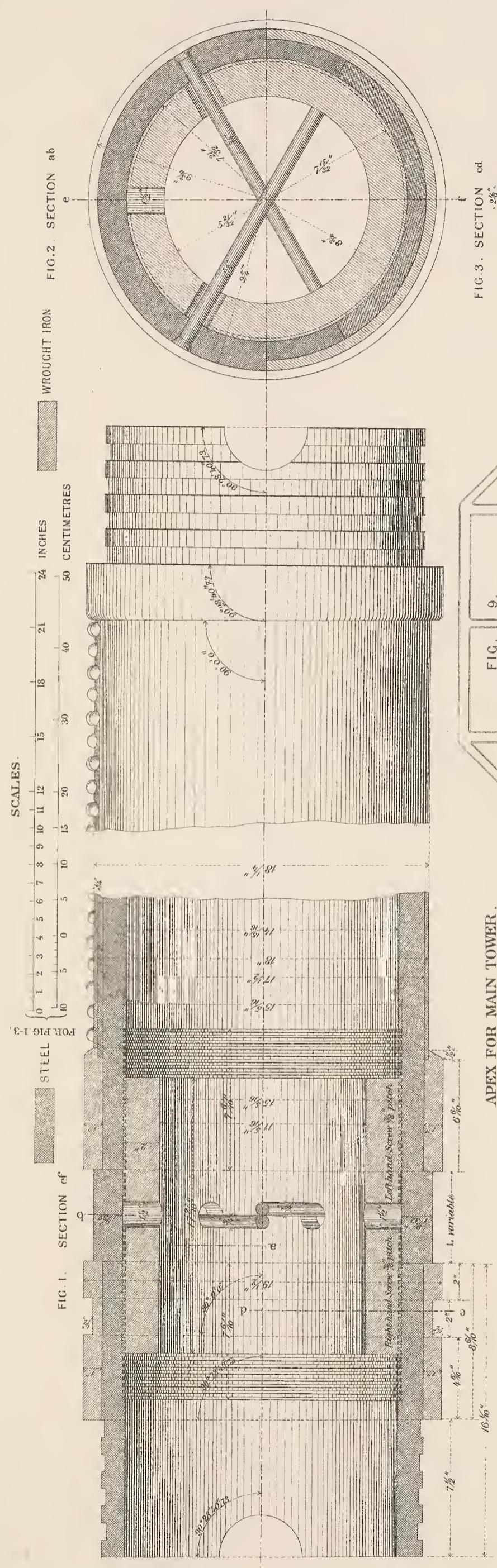
FIG. 1-10. DOTTED LINES IN FIG. 1 REPRESENT
WEST PIER
AUXILIARY CABLES.

Julius Bien, lith. N.Y.

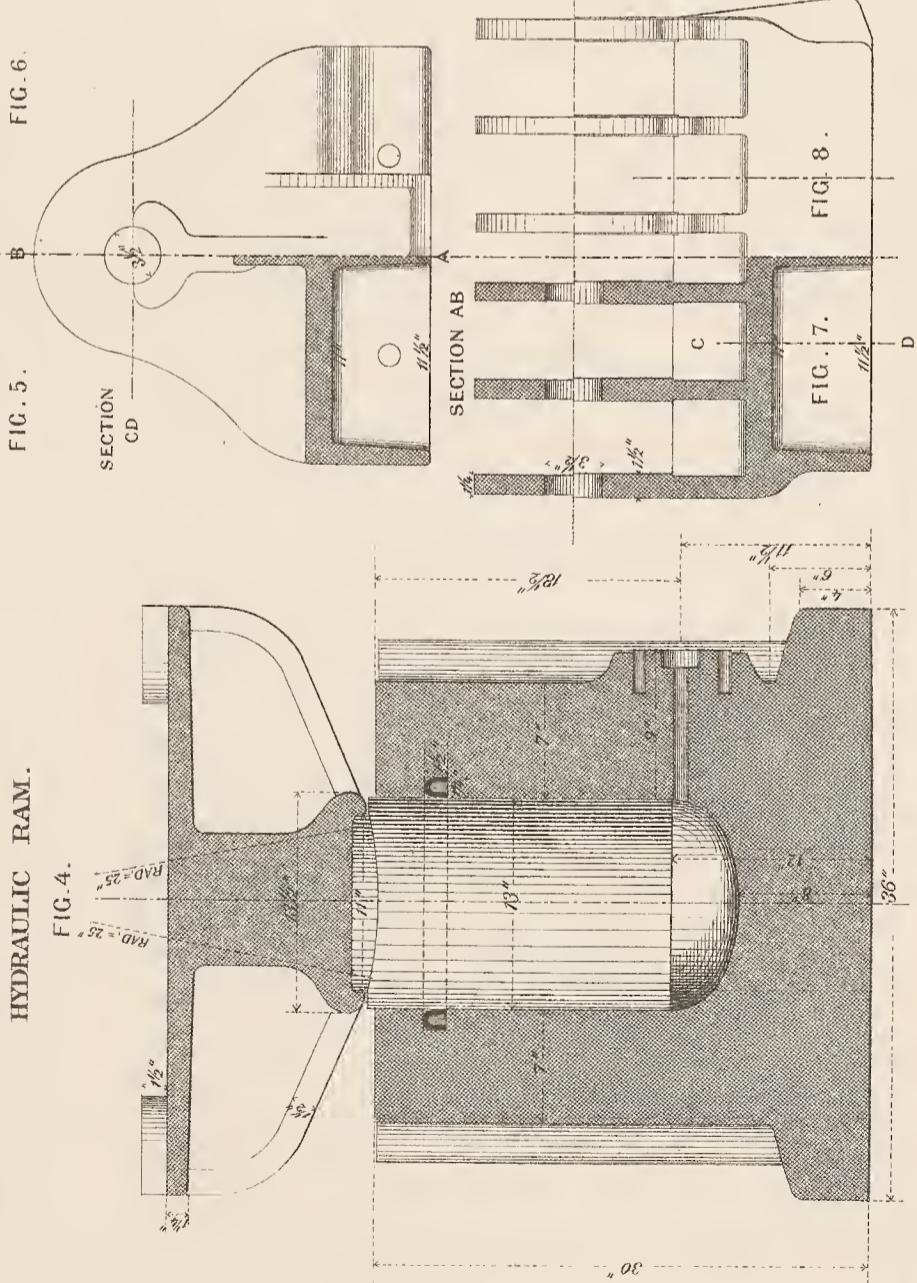
W.P. Bernard, del. 1880

ADJUSTABLE TUBE AND DETAILS OF ERECTION.

ADJUSTABLE TUBE.



APEX FOR MAIN TOWER.



HYDRAULIC RAM.

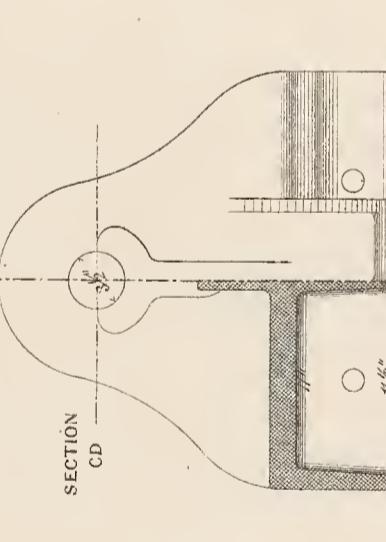


FIG. 5. FIG. 6.

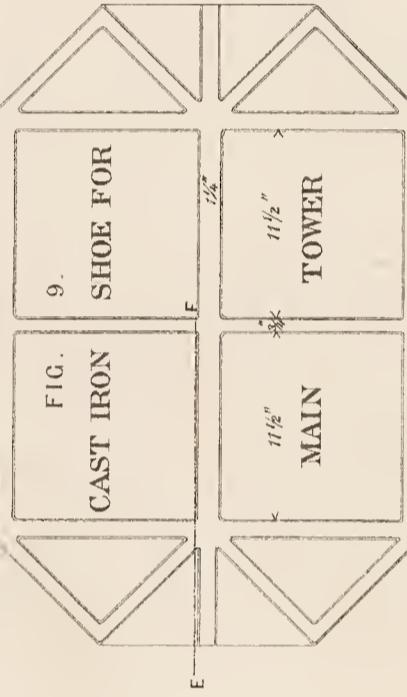


FIG. 3. SECTION cd
BALANCE -
GAUGE.

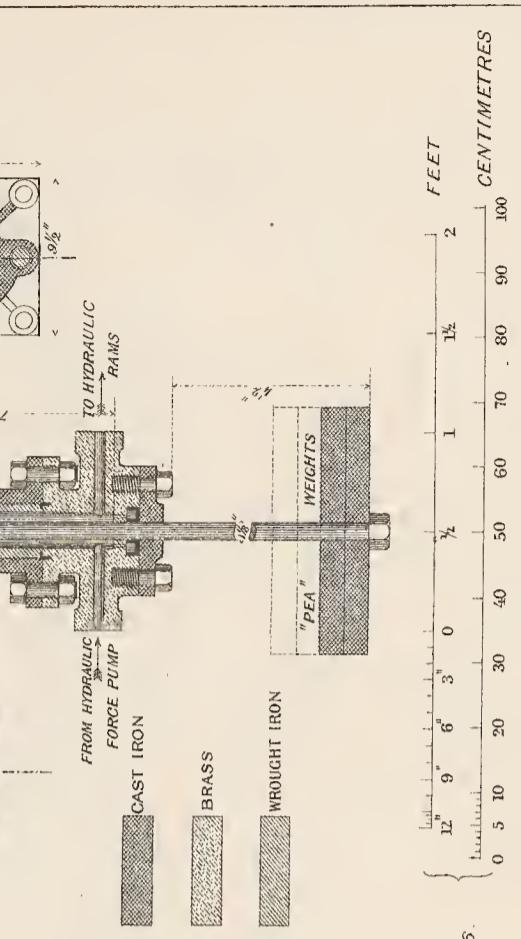
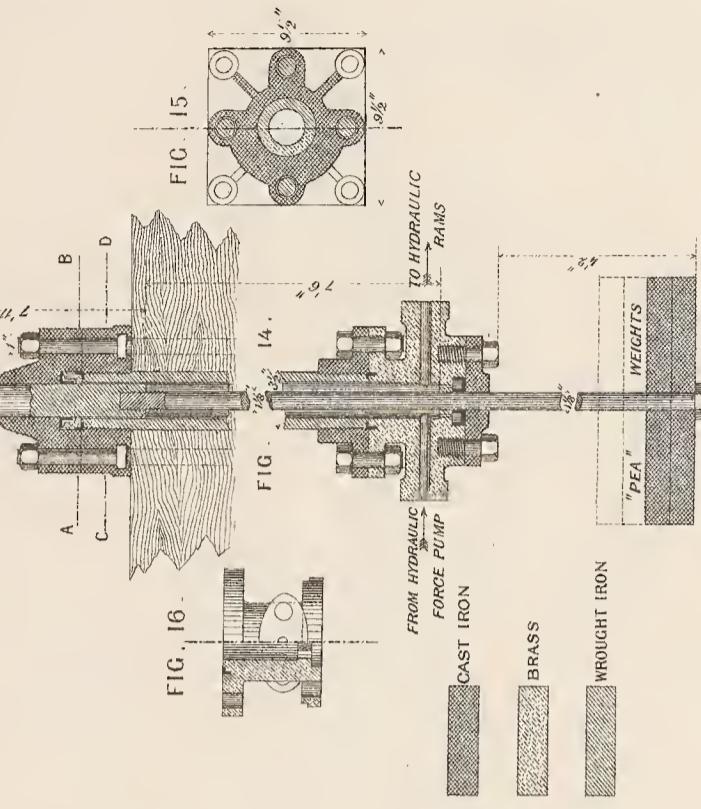
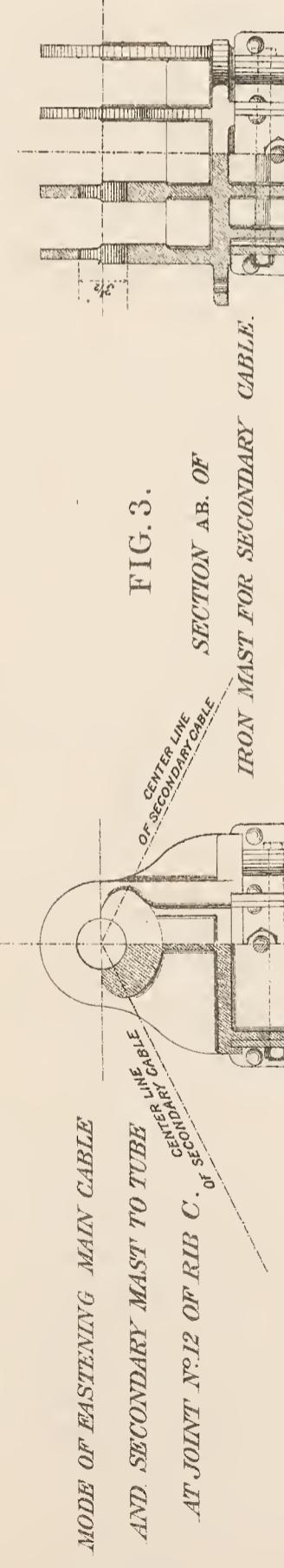


FIG. 12. SECTION LM.

DETAILS OF ERECTION.

FIG. 1.



MODE OF EASTENING MAIN CABLE
AND SECONDARY MAST TO TUBE
LINEABLE
CENTRAL CABLE
OF CENTER LINE
OF SECONDARY CABLE

FIG. 2.
SECTION AB. OF
IRON MAST FOR SECONDARY CABLE.

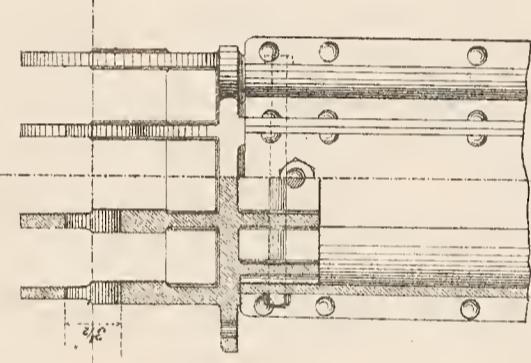
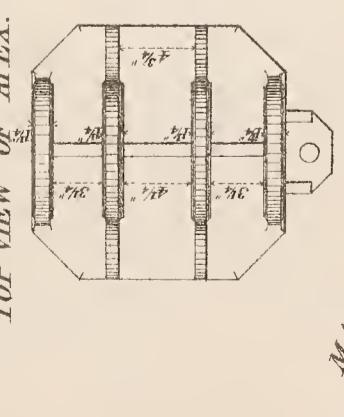


FIG. 4.

TOP VIEW OF APEX.



MAIN CABLE.

FOR GENERAL ARRANGEMENT
OF MAST FOR SECONDARY CABLE SEE PLATE XXXVI.

STIRRUP CLAMP OF JOINT N°6.

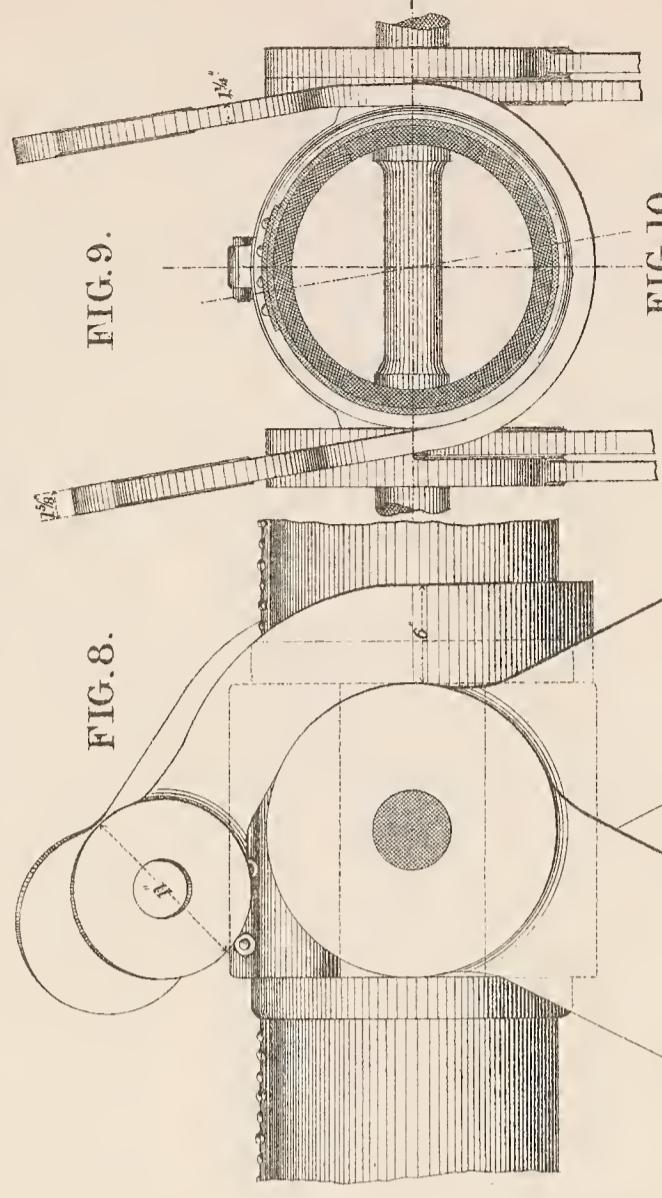


FIG. 5.

JOINT N°12 OF RIB C.

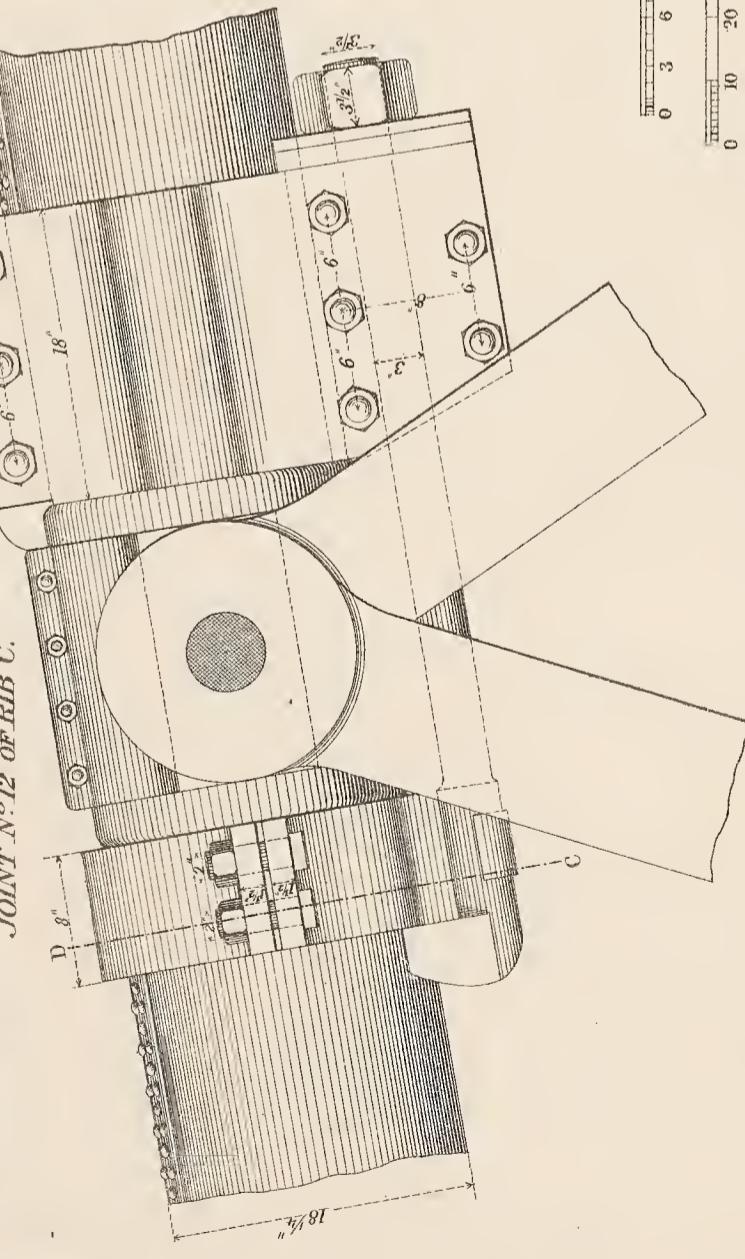
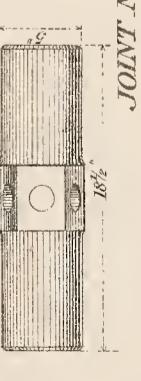


FIG. 6.
SECTION CD.

FIG. 8.

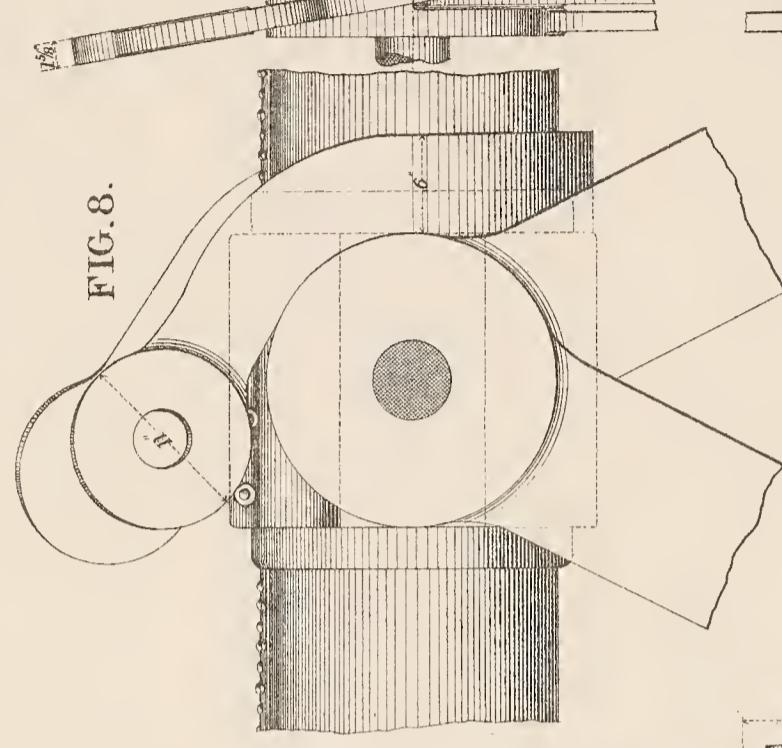


FIG. 9.

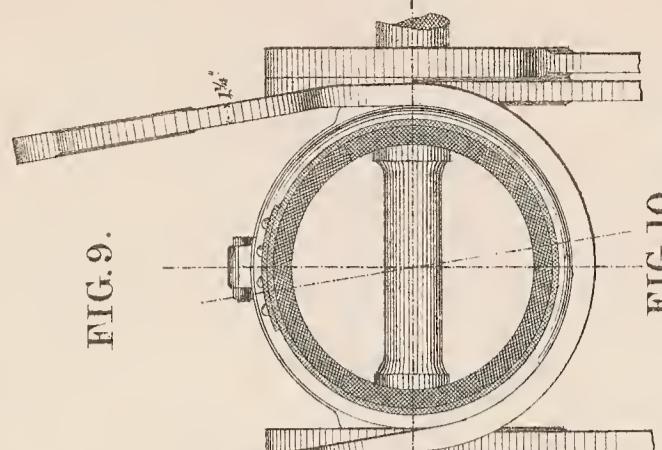


FIG. 10.

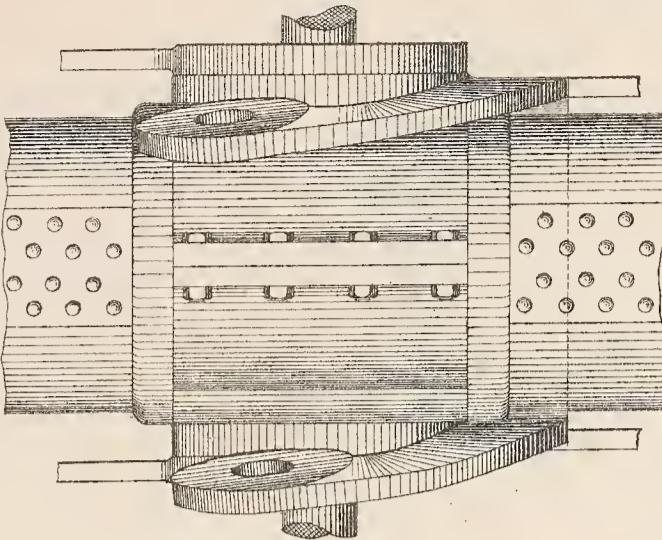
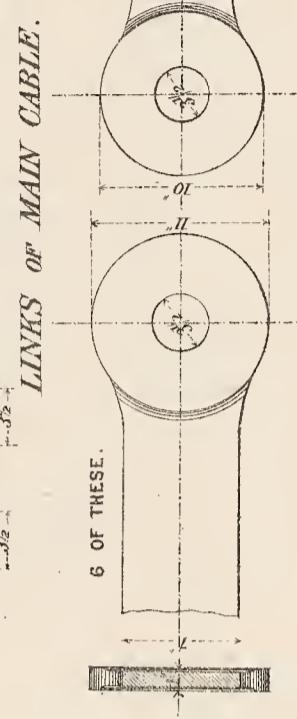
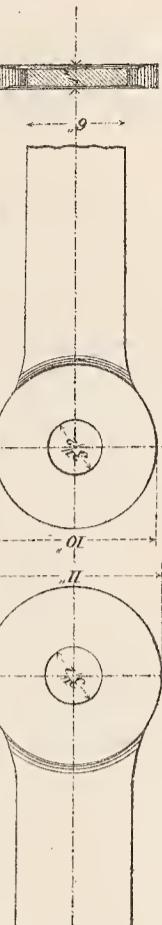


FIG. 7.

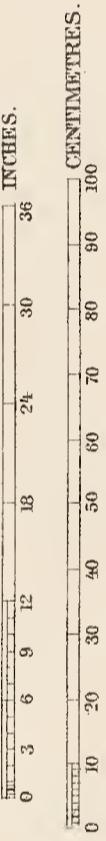


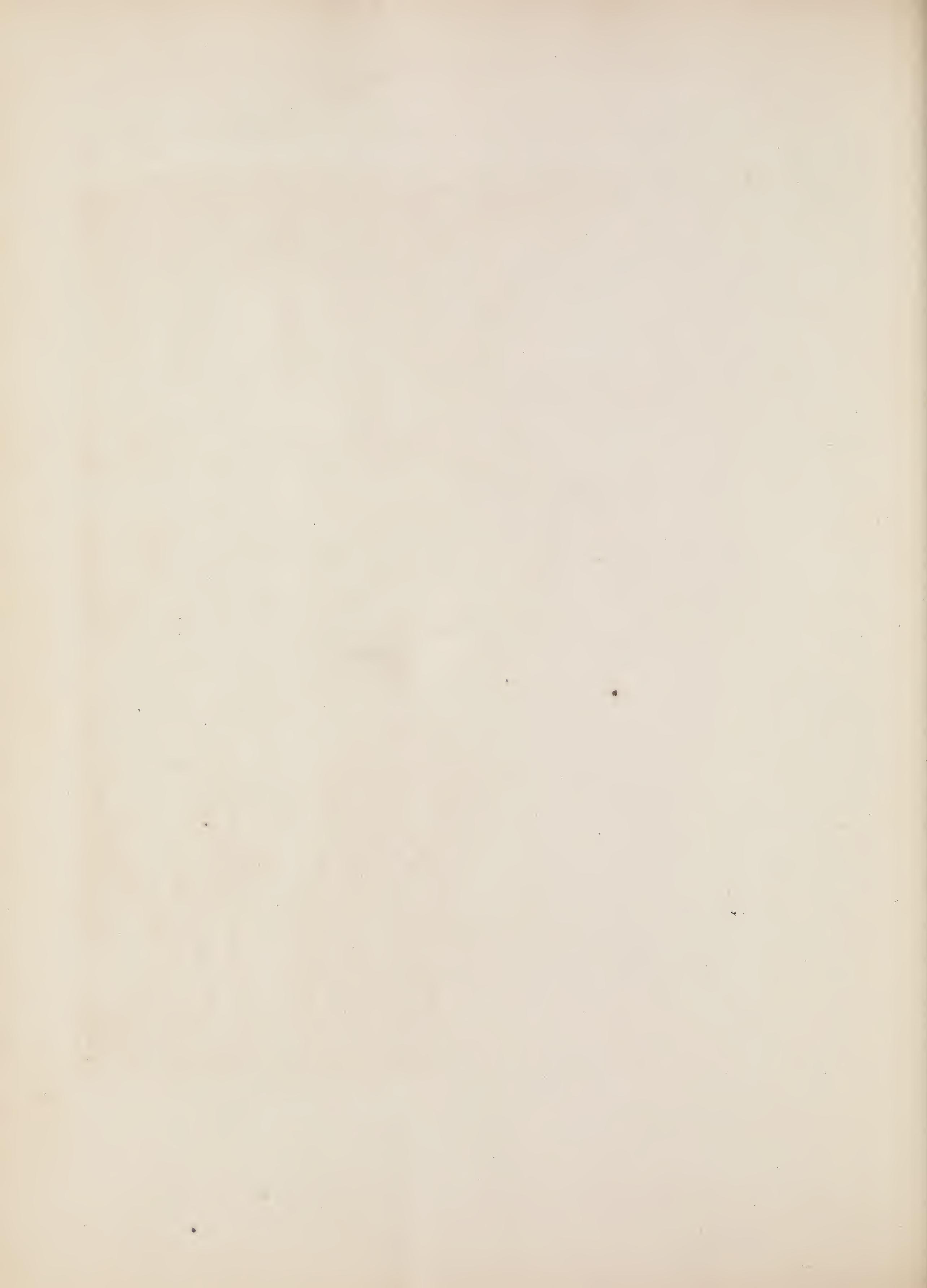
LINKS OF MAIN CABLE.

6 OF THESE.



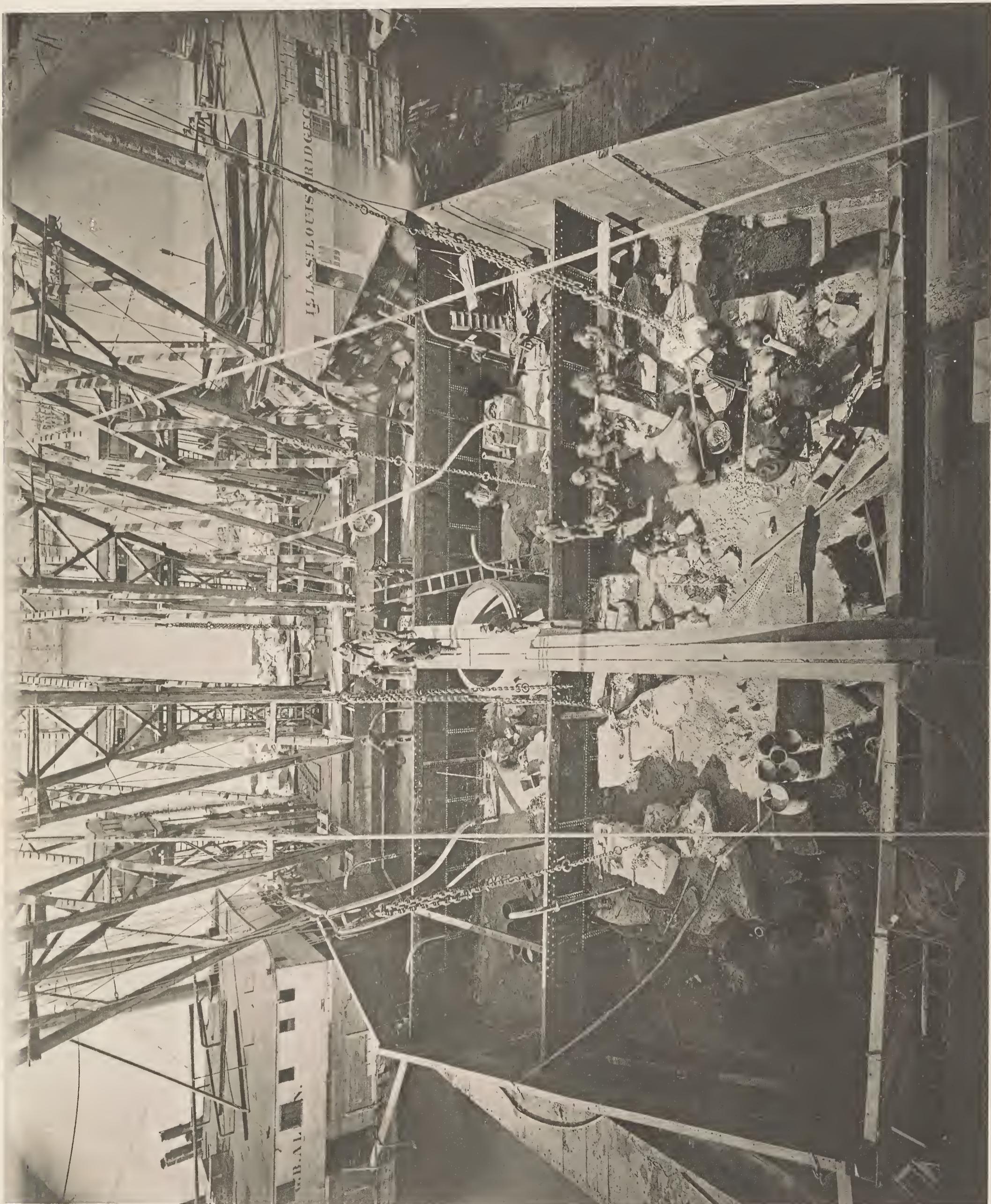
USED ALTERNATELY.







SINKING THE WEST PIER. ICE-BREAKER IN THE FOREGROUND.



SINKING THE EAST ABUTMENT. LAYING MASONRY ON THE FLOATING CAISSON.



ERECTION OF WEST AND CENTER ARCHES. VIEW LOOKING NORTH-EAST.



ERECTION OF WEST ARCH, SHOWING CABLES TO JOINTS 6, 9, AND 12.



THE ERECTION. CLOSING THE CENTER AND EAST ARCHES.



THE ERECTION. THE RIBS COMPLETED AND THE ROADWAYS BEGUN.



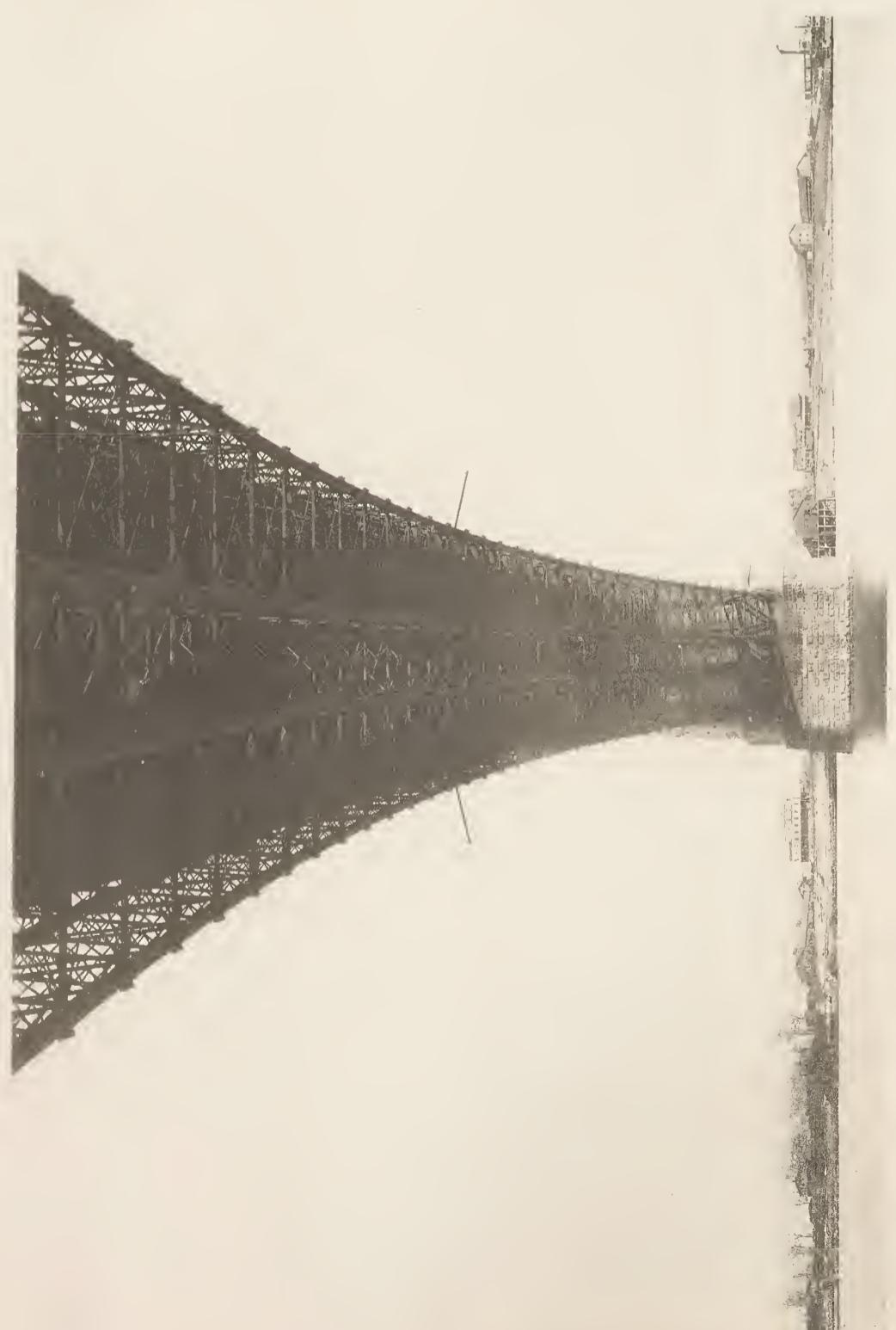
THE CENTER ARCH SEEN FROM BETWEEN THE RAILROAD TRACKS



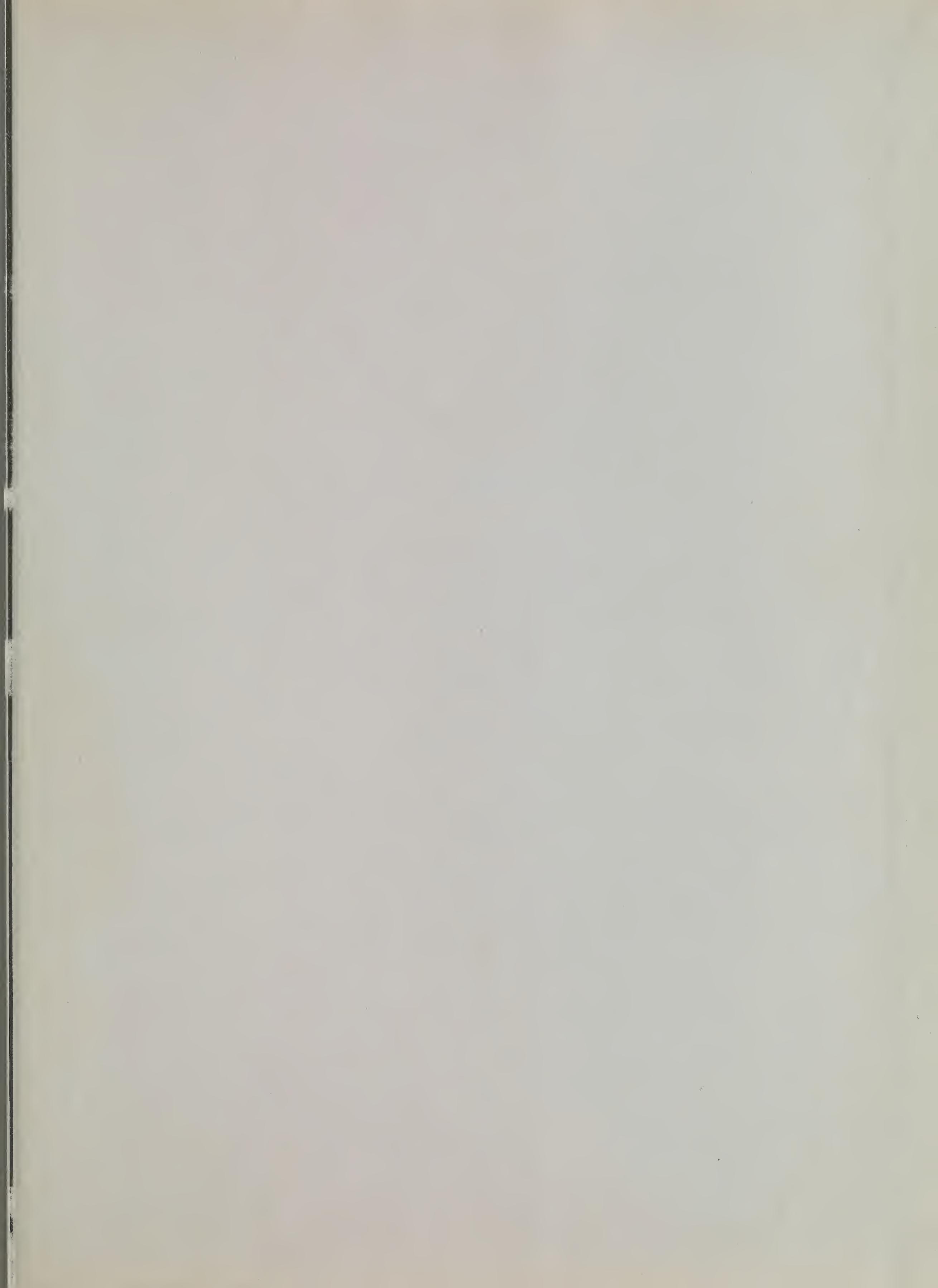
THE UPPER ROADWAY LOOKING EAST.

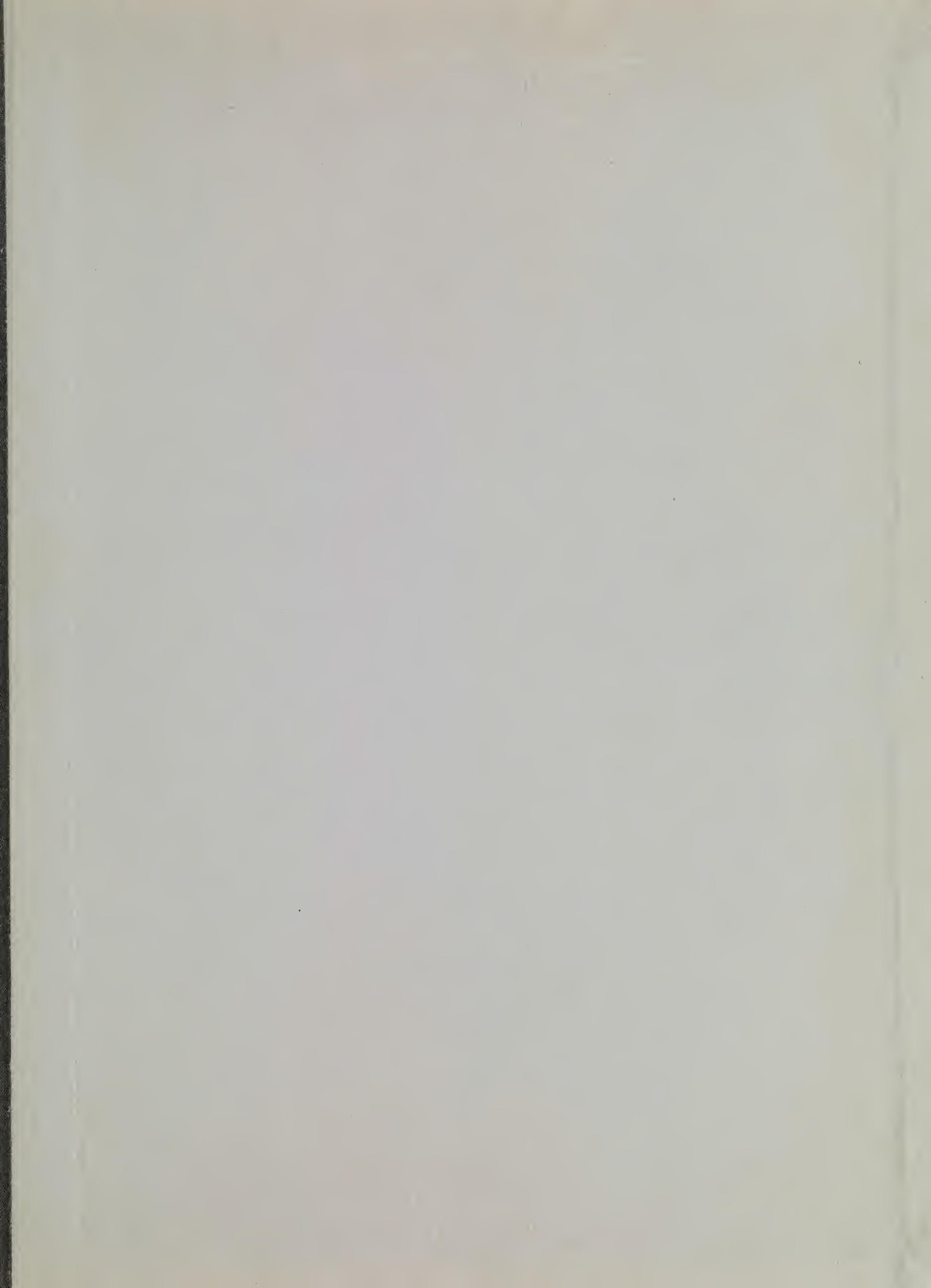


SOUTH TRACK OF CENTER SPAN, LOOKING EAST.



VIEW OF WEST ARCH FROM WATER'S EDGE AT WEST ABUTMENT.







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Illinois and St. Louis Bridge /